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ABSTRACT

This publication abstracts periodicals between 1981 and 1990 and identifies dissertation research reported between 1971 and 1990 as a tool for professors, graduate students, and other professionals with environmental education research interests. This publication was designed to allow users to locate citations and abstracts relevant to their interests in environmental education quickly and easily. There is a major division between periodical literature abstracts and dissertation abstracts. Each of these has an introduction to the abstracts and an identification of the descriptors which have been used in their cataloguing. The periodical literature abstracts (1981-1990), which are numbered 001-211, are followed by an index for the periodical literature according to author and descriptor. The dissertation abstracts are separated into two groups, one covering the period 1971-1980, numbered 212-522, and the dissertation abstracts for 1981-1990, numbered 523-829. Each period is followed by a dissertation abstract descriptor index for that period. The dissertation abstracts 1981-1990 are also followed by the dissertation abstract author index for the complete period 1971-1990. Includes definitions and operating procedures for the abstracting projects. (PVD)

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ED 406 181

RESEARCH
IN
ENVIRONMENTAL EDUCATION
1981-1990

THE NORTH AMERICAN COMMISSION FOR ENVIRONMENTAL EDUCATION RESEARCH

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NAAEE
NORTH AMERICAN
ASSOCIATION FOR
ENVIRONMENTAL
EDUCATION

April 1996

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RESEARCH
IN
ENVIRONMENTAL EDUCATION
1981-1990

Dr. Tom Marcinkowski
and
Dr. Rick Mrazek
(Editors)

The North American Commission
for
Environmental Education Research
1996

NORTH AMERICAN ASSOCIATION FOR ENVIRONMENTAL EDUCATION

NAAEE is a network of professionals and students working in the field of environmental education throughout North America and in over 45 countries around the world. Since 1971, the Association has promoted environmental education and supported the work of environmental educators. There are many environmental interest groups, and many organizations dedicated to improving education. NAAEE uniquely combines and integrates both of these perspectives, and takes a cooperative, nonconfrontational approach to promoting education about environmental issues.

The Association is made up of people who have thought seriously over lifetimes about how people become literate concerning environmental issues. NAAEE members believe education must go beyond consciousness-raising about these issues. It must prepare people to think together about the difficult decisions they have to make concerning environmental stewardship, and to work together to improve, and try to solve, environmental problems.

NAAEE recognizes the need for a coherent body of information about environmental issues. Its members also recognize that information and analysis are only part of an effective education program. To be truly effective, this body of knowledge must be integrated into all aspects of the curriculum and into all types of educating institutions for the widest array of audiences.

In order to translate theory into reality, and provide tangible support for environmental education and environmental educators, NAAEE engages in a variety of programs and activities. Some examples are the annual conference at varying North American sites, an extensive publications program, the Environmental Education Training Institute, the VINE (Volunteer-led Investigations of Neighborhood Ecology) Network, the Environmental Issues Forums (EIF) program, the NAAEE Policy Institute, the Environmental Education and Training Partnership (EETAP), and NAAEE's Environmental Education Standards Project.

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Research in Environmental Education 1981-1990
The North American Commission for Environmental Education Research

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PREFACE

There is a history to the substance of this document, and the group of professionals who helped put it together. It is told, and in part, retold, because in my opinion, these professionals deserve recognition for laboring "behind the scenes" on behalf of the field - without tangible benefit. In 1980, NAEE President Clay Schoenfeld invited a group of NAEE members to discuss the need for and feasibility of compiling abstracts and/or summaries of research in environmental education (EE). This group was first called "The National Commission on Environmental Education Research" (NCEER). To be consistent with the change of NAEE to NAAEE in 1983, NCEER later became "The North American Commission for Environmental Education Research" (NACEER), a group which now numbers over forty, with membership across and extending beyond North America.

Why this change to NCEER? During the 1970s, there was marked growth in the perception that research and evaluation efforts in the field were important. The number of theses, dissertations and other studies in the field increased dramatically, as is evident in The Journal of Environmental Education and in research documents prepared by members of NACEER. With growth in the number of studies came an increase in their diversity: studies became ever more diverse in their focus, purpose and scope; the sectors in which studies were conducted; and more recently, the research paradigms in which studies were grounded. Clearly, it was no longer feasible for one or two people to review and synthesize the research in the field (e.g., as had been done by Roth, Helgeson, Voelker, Horvat, Schoenfeld, and others). This work had to be undertaken by a larger group of professionals, such as NCEER, and this required both advance planning and coordination.

In 1981, under the leadership of Dr. Lou Iozzi, then Chair of NCEER, the Commission undertook its first major effort; i.e., to abstract the periodical and identify the dissertation research (i.e., peer reviewed research) reported in the 1971-1980 period. The resulting product, Research in Environmental Education, 1971-1980 (RIEE; 1981), proved to be a valuable tool for professors, graduate students, and other professionals with research interests. At NAAEE Conferences, a number of professionals told me that they did not know how they would have completed their dissertations without it. Shortly after its completion, Dr. Iozzi and members of NCEER undertook the "next step"; i.e., a project designed at synthesizing the research abstracted in RIEE. This became the second product of the Commission, A Summary of Research in Environmental Education, 1971-1982; The Second Report of the National Commission on EE Research (1983), and was published as Volume II in NAAEE's now lengthy monograph series.

Due to the extensive and intensive level of effort required to produce these two documents, NCEER members took a much needed break. As breaks go, that one was modest in length. By the later 1980s, members of NACEER decided to undertake a companion to RIEE which would cover the 1981-1990 time period. A planning and training session for this project was held during NAAEE's 1989 Conference in Estes Park. Over the 1989-91 period, NACEER members engaged in two tasks: (a) some members worked alone or with teams of graduate students to abstract EE research reported in periodicals they had selected; and (b) I undertook a manual search of dissertation abstracts. Since the dissertation search for RIEE (1981) had been done through ERIC, rather on a manual basis, a sizable number of dissertations were unfortunately missed. In order to recognize and help professionals access such studies, a decision was made to conduct this dissertation search for the full 1971-1990 period. The results of these efforts are found in the two major sections of this document. The definitions, parameters, and descriptors which guided these efforts appear either at the front of this document, or at the front of each of these two sections.

Users may recognize several important features of this document. First, it is rather substantial in size, covering over 830 studies. Indeed the research literature has grown, and the need for this kind of effort is ever more apparent. An author index and a descriptor index have been prepared to help users locate studies in this volume which are of potential interest. Second, there are periodicals which print reports of EE or EE-related research which are and are not included in this document. A modest apology is offered to those affected by this, and an appropriate disclaimer is offered to indicate that this is not an exhaustive work. In defense of the developers, there were practical problems to contend with, such as the limited ability to find all targeted periodicals in accessible libraries, and time constraints in meshing these tasks with other university responsibilities. Third, the document is relatively "seamless"; i.e., it does not reflect the difficulties of multiple authorship, or of work completed on a variety of word processing and desktop publishing software packages. Much of this work was done in that narrow historical window between the era of IBM/Mac competition and the current era of relatively painless conversion programs. Fourth, many would like to have seen this document finished several years ago. In light of a constant flurry of demands on my time, I was simply unable to achieve that, and apologize to those affected by delays. On the other hand, I am very grateful that Dr. Rick Mrazek, one of the current Co-Chairs of NACEER, offered his assistance in finishing off and cleaning up this document. It would not have seen the light of day without his final, supportive efforts.

To the users of this document, enjoy the fruits of our labors. May your ability to access these portions of the research literature help you better understand and plan your EE activities, be they further research or efforts apply research results to your practice. Use it frequently and use it wisely!

Dr. Tom Marcinkowski, Florida Institute of Technology
Former Chair, NACEER, 1988-1993

ORGANIZATION OF RESEARCH IN ENVIRONMENTAL EDUCATION (1981 - 1990)

This publication has been set out in a manner which hopefully will allow users to locate citations and abstracts relevant to their interests in environmental education quickly and easily. To assist with this there is a major division between Periodical Literature Abstracts and Dissertation Abstracts. Each of these will have an introduction to the abstracts and an identification of the descriptors which have been used in their cataloguing. At the end of the **periodical literature abstracts (1981 - 1990)** which are numbered **001 - 211**, there is an index for the periodical literature according to author and descriptor.

Following an introduction to the abstracts of the dissertation literature and a listing of the dissertation abstract descriptors, the **dissertation abstracts** are then separated into two groups, one covering the period **1971 - 1980** numbered **212 - 522** and the dissertation abstracts for **1981 - 1990** which are numbered **523 - 829.** Following the dissertation abstracts **1971 - 1980** there is a dissertation abstract descriptor index for that period. Similarly, following the dissertation abstracts **1981 - 1990** there is a dissertation abstract descriptor index for that period as well as the dissertation abstract author index for the complete period **1971 - 1990**.

There is also a comprehensive abstract descriptor index for the period **1971 - 1990** for both the periodical literature abstracts and the dissertation abstracts.

Hopefully, by using this format, users will be able to quickly access specific information in the periodical literature or dissertations, as well as have an avenue for perusing both based on the comprehensive descriptor index.

To reinforce Tom Marcinkowski's earlier comments, it is hoped that the efforts of so many commission members and their students can now be put to good use by our colleagues engaged in practice and research in environmental education.

Dr. Rick Mrazek, The University of Lethbridge, Alberta, Canada
Co-Chair, NACEER, 1994 - Present

DEFINITIONS AND OPERATING PROCEDURES FOR THE ABSTRACTING PROJECTS

Definitions

To help guide the research efforts of the teams of researchers, the Commission operationally defines the following terms:

> Research: Investigations employing systematic or naturalistic methods to study or interpret phenomena. It employs valid observations with an intent to generalize findings or build new models.
>
> Environmental Education Research: Includes, but is not limited to, components of efforts aimed at developing and/or measuring environmental awareness, ecological and issue-related scientific knowledge, issue investigation and decision-making skills, the empowerment of learners as environmental change agents, citizenship behavior (responsible environmental behavior), and allied variables.

In addition, it includes studies of programs, projects, personnel, facilities, curricular materials, and other resources involved in the delivery of EE. Finally, it includes systematic reviews, critiques, summaries, and syntheses of research studies in EE.

Bibliographic Style

In terms of the format to be used for bibliographic citations, a copy of the format used was forwarded twice to members involved. It follows APA style, and which is a change from the format previously used.

Author's last name, first initial.; & same for other authors. (Year). Title of the article. Title of the Periodical, Volume No. (Issue No.), beginning page - ending page.

Arbuthnot, J. (1977). The roles of attitudinal and personality variables in the prediction of environmental behavior and knowledge. Environment and Behavior, 9(2), 217-232.

Crosby, L., Gill, J., & Taylor, J. (1981). Consumer/voter behavior in the passage of the Michigan container law. Journal of Marketing, 45(2), 19-32.

Steininger, M., & Voegtlin, K. (1976). Attitudinal bases of recycling. Journal of Social Psychology, 100(1st Half), 155-156.

Descriptors

The original set of descriptors used in RIEE (1981) was modified and expanded as follows.

The entries to be reviewed will be coded using the following descriptors. Those no longer used have been dropped. While changes are necessary, it is also important to try to maintain a fair degree of consistency with the Commission previous efforts in abstracting.

EE GOAL LEVELS

environmental sensitivity
ecology education
issue awareness/knowledge of issues
issue identification and analysis skills
issue investigation and evaluation skills
values clarification skills
citizenship action

EE FACILITIES

outdoor classrooms
environmental/nature centers
museums
community resources

EDUCATION LEVEL

elementary
middle/junior high school
secondary
higher education
continuing education
teacher education preservice
teacher education inservice

LEARNING DOMAIN

cognitive
affective
psychomotor

EE METHODS

individualized instruction
investigation
action learning
lecture
directed instruction
field trip
outdoor education
games
simulations
role playing
values/moral education
case study

EE LEARNER TRAITS

educational background
social background
ethnic background
economic background
rural
urban
personality type
environmental sensitivity
intelligence
cognitive style
knowledge
beliefs
preferences
attitudes
values
moral development
locus of control (efficacy perception)
personal responsibility
verbal commitment
citizenship
behaviors

NATURE OF THE STUDY

program development
program implementation
program evaluation
hypothesis generation
model building
instrument development

RESEARCH METHODS

historical research
theoretical research
experimental research
pre-experimental research
ex post facto research
descriptive research
naturalistic (ethnographic) research
unobtrusive research
secondary analysis
trend analysis
synthesis of research

EE CONTENT AREA

outdoor education
conservation education
resource management education
vocational education
mathematics education
language arts education
social studies education
science education
STS education
issue-based
population education
energy education
marine education
global education
futures education
values/moral education
religious education

EE CURRICULUM MODE

interdisciplinary
multi-disciplinary (infusion)
disciplinary
formal
non-formal

Operating Procedures

NCEER OPERATING PROCEDURES for THE ABSTRACTING PROJECT

1. NCEER Members agree to task and set parameters (Oct., 1988)

2. Training of NCEER Supervisors and Assistants (August, 1989)

3. Assignment/assumption of responsibilities for tasks by NCEER Supervisors and NCEER Project Coordinator (August - Fall, 1989)

4. NCEER Supervisors assign tasks to Research Assistants/Graduate Students, and provide appropriate supervision at each of the following steps.

- The Research Assistants/Graduate Students will ...

  .... search assigned sources and identify articles for inclusion;

.... complete abstract for each article using the abstract guide;

.... review each abstract for coverage, length, and language; and

.... submit completed abstracts to the NCEER Supervisor.

- The NCEER Supervisors will ...

  .... Review abstracts, rendering either an 'Approve' or a 'Revise' based upon comparison to the abstract guide and the original article (the latter when necessary);

  .... 'Spot check' sources and articles to insure accurate application of definitions, and accurate interpretation of article;

  .... Work with all research assitants and graduate students to insure consistency and to refine procedures as needed; and

  .... Forward all completed / reviewed abstracts to Project Coordinator.

- The NCEER Project Coordinator will ...

  .... Review and, as needed, adjust abstracts for consistency, etc.;

  .... Forward final set of camera ready abstracts to our publisher.

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INTRODUCTION TO ABSTRACTS OF THE PERIODICAL LITERATURE

List of Periodicals and Members Who Abstracted Them

The lists below represent the best match I can make based upon my records. In the periodicals column, the underlined periodicals are those added to the list reviewed in RIEE. You should double-check to insure that we have abstracts from each of those "taken" by members. Also, the list of "reviewers" identifies members who worked on abstracts. I have kept the references for the three periodicals Arjen reviewed and/or "abstracted" even though his abstracts were incomplete, did not follow the format, and were therefore unusable. There may be others in the list who never completed usable abstracts; this could be checked on Claris using periodical titles under "Find/Change."

Periodicals	Reviewers
American Psychologist	
Behavioral Science	
Communications Abstracts	Ohio State: Roseanne Fortner
Communications Research	
Currents, The Journal of Marine Education	Ohio State: Roseanne Fortner
Environment and Behavior	E. Illinois: Marilyn Lisowski
Human Communications Research	
Journal of Applied Behavior Analysis	No. Iowa: Jodi Hines-Stone
Journal of Communication	
Journal of Conflict Resolution	U. of Mich.: Arjen Wals
Journal of Consumer Research	
Journal of Contemporary Education	U. of Mich.: Jim Bull
Journal of Educational Research	Cal. State: Archie Sia
Journal of Educational Psychology	Cal. State: Archie Sia
Journal of Environmental Education	So. IL: H. Hungerford + T. Volk
Journal of Environmental Ethics	
Journal of Geographic Education	U of Wisc.: Dan Sivek
Journal of Interpretation (USA)	
Journal of Interpretation (Canada)	U. of Mich.: Jim Bull
Journal of Leisure Research	
Journal of Marine Technology	Ohio State: Rosanne Fortner
Journal of Marketing	Ohio State: Rosanne Fortner
Journal of Marketing Research	Ohio State: Rosanne Fortner
Journal of Outdoor Education	No. Illinois: Bora Simmons
Journal of Psychology	Cal. State: Archie Sia
Journal of Research in Science Teaching	Cal. State: Esther Railton
Journal of Social Issues	U. of Mich.: Arjen Wals
Journalism Quarterly	
Natural Resources Journal	U of Wisc: Dan Sivek
Public Opinion Quarterly	Ohio State: Rosanne Fortner
Rural Sociology	U of Wisc: Dan Sivek
School Science and Mathematics	No. Iowa: Jody Hines-Stone
Science Education	Ohio State: Rosanne Fortner
The American Biology Teacher	U of Wisc: Dan Sivek

Phenomenology and Pedagogy
The Physics Teacher
Science Education
The Science Teacher
Youth and Science

U of Mich: Arjen Wals

Ohio State: Rosanne Fortner

List of Member-Participants

Jim Bull, (formerly) University of Michigan
Roseanne Fortner, Ohio State University
Ron Gardella, Northern Kentucky University
Jody Hines-Stone, University of Northern Iowa
Harold Hungerford, Southern Illinois University
Marylin Lisowski, Eastern Illinois University
Tom Marcinkowski, (formerly) Maryville University
Rick Mrazek, University of Lethbridge
Esther Railton, California State University at Hayward
Archie Sia, California State University at Northridge
Deborah Simmons, Northern Illinois University
Dan Sivek, University of Wisconsin - Stevens Point
Trudi Volk, Southern Ilinois University
Arjen Wals, (formerly) University of Michigan

Many of these member involved teams of their graduate students in the abstracting processes(e.g., OSU, SIU, UWSP), though not all of them did.

Abstracting Guide

A. BIBLIOGRAPHY AND INDEXING INFORMATION
    1. Author(s) name(s) (last name first)
    2. Title of Article
    3. Source. For Journals:
        (a) year; (b) volume; (c) issue; (d) month (or season); (e) pages
    4. Statement of the Problem, Purpose, or Given Hypothesis
    5. Independent Variables
    6. Dependent Variables

B. DESCRIPTION OF SUBJECTS or SAMPLES (completed as available)
    1. Total number in the study
    2. Methods of selection and assignment
    3. Number of treatment groups
    4. Response percentage
    5. Experimental mortality
    6. Age of subjects:
        (a) children; (b) adolescents; (c) adults; (d) elderly
    7. Gender:
        (a) male; (b) female; (c) males and females
    8. Geographic region
    9. Race of subjects/sample(s)
    10. Religious affiliation of subjects/sample(s)
    11. Education

12. Social Class
13. Income or economic level
14. Occupation
15. Marital Status
16. Other important demographic variables

C. RESEARCH METHODS
1. Category of Research
   a. Historical
   b. Theoretical research
      * Hypothesis generation
      * Model building
   c. Experimental (true, quasi, pre)
      * Solomon 4 group
      * pretest - posttest control group
      * posttest only control group
      * other (see Campbell and Stanley, 1961)
   d. Descriptive
      * Survey
      * Longitudinal or Cross-Sectional
      * Case Studies
      * Correlational
      * Ex Post Facto (Causal-Correlational)
      * Other (see Issac and Michael, 1981)
   e. Naturalistic (ethnographic)
      * Interviews
      * Observation Logs
      * 'Thick' Description of Phenomena
      * Triangulation of data sources
   f. Unobtrusive research (see data collection techniques)
   g. Secondary analysis
   h. Synthesis of research findings
      * Qualitative or narrative synthesis
      * Vote-counting
      * Chi-square analysis
      * Meta-analysis
   i. Trend Analysis
   j. Instrument Development
2. Data Collection Techniques
   Observing and Recording Behavior
   a. Obtrusive Measures
      (1) Questionnaires (by type; e.g., Likert, Seamtic Differential)
      (2) Interviews (by type; e.g., structured vs. unstructured)
   b. Unobtrusive Measures
      (1) Archives and Records
      (2) Physical Traces
      (3) Non-Verbal
      (4) Combination
   c. Both Obtrusive and Unobtrusive
3. Properties of the Measures
   a. Origins and development

   - b. Intended uses (by population, by region, etc.)
   - c. Validity procedures and estimates (were/not reported)
   - d. Reliability procedures and estimates (were/not reported)
4. Results
   - a. Data analysis methods used
     - (1) Statistical Analyses used
     - (2) Content or Classification procedures used
     - (3) Qualitative Methods used
   - b. Level of significance (p or probability)
   - c. Findings and/or conclusions
   - d. Implications for further research
   - e. Recommendations for further research
   - f. Follow-up
5. Number of References Listed

Types of Publications Reviewed in RIEE Which Were Not Reviewed in This Project

Yearbooks and Monographs (These reports rarely contain complete info)

Current Issues in Environmental Education and Environmental Studies, Volume VII (1981)

Current Issues in Environmental Education and Environmental Studies, Vol. VIII (1982)

Monographs in Environmental Education and Environmental Studies, Volume I (1984; covers the 1983 Conference Proceedings)

International Perspectives on Environmental Education: Issues and Actions (1984)

Environmental Education: Toward a Sustainable Future (1985)

Environmental Education: Transition to an Information Age (1986)

Excellence in Environmental Education: Gaining Momentum for the Challenges Ahead (1987)

Building Multicultural Webs Through Environmental Education (1988)

Monographs in Environmental Education and Environmental Studies, Volume III: International Aspects of Environmental Education (1986)

Monographs in Environmental Education and Environmental Studies, Volume IV: A Special Issue of the Environmental Professional (Vol. 9, No. 3): Focus on Environmental Studies (1987)

Recent Master's Works contain printed abstracts, and are largely available to the field. Is was not seen as necessary to duplicate these for the later inclusion in another 10 year collection.

Fugitive Literature
A computer search of the ERIC Database should have been conducted for the period beginning January, 1981, and ending December, 1989. Modified ERIC abstracts, as printed in Resources in Education, could be used for all reports meeting the definitions posed.

PERIODICAL LITERATURE DESCRIPTORS (n=128)

action learning
adult/continuing education,
affective domain,
affective,

attitude and science education,
attitudes,
behaviors,
beliefs,

case study,
citizenship,
citizenship action,
cognitive learning,
cognitive,
community resources,
community/regional resources,
conservation education,
content analysis,
continuing education,

descriptive methods,
descriptive research attitudes,
descriptive research,
development of TV program,
directed instruction,
disciplinary,

ecology education,
economic background,
educational background,
elementary,
energy conservation,
energy education,
enviromental education,
environmental sensitivity,
environmental/nature centers,
ethnic background,
ethnographic research,
ex post facto research,
experimental research (quasi),
experimental research,
expert analysis,

field trips,
formal,

games,
global education,

higher education,
historical research,
hypothesis generation,

information sources,
inquiry/investigation,
instrument development,
inter-disciplinary,
investigation,
issue awareness,
issue awareness/knowledge of issues,
issue identification and analysis
    skills,
issue investigation and evaluation
    skills,
issue investigation,
issue-based,

knowledge,

lecture,
locus of control,
locus of control/efficacy,
longitudinal,

marine education,
media based,
middle/junior high school,
middle/junior high,
model building,
moral development,
multi-disciplinary infusion,
multi-disciplinary,
museums,

naturalistic research,
non-formal,

outdoor classrooms,
outdoor education,

perceptions/beliefs,
personal responsibility,
personality type,
population education,
pre-experimental research,
pre-experimental,
preferences,
print media,
program development,

PERIODICAL LITERATURE DESCRIPTORS (n=128)

program evaluation,
program implementation,
psychomotor,
public education,

quasi-experimental research,

religious education,
resource management education,
rural,

science education,
secondary analysis,
secondary education,
simulations,
social background,
social studies education,
STS education,
synthesis of research (meta-analysis),
synthesis of research,
synthesis research,

teacher education in-service,
teacher education pre-service,
television,
theoretical research,
trend analysis,

unobtrusive research,
urban,

values,
values clarification,
values/moral education,
verbal commitment,
verbal commitment/intention

PERIODICAL LITERATURE ABSTRACTS (1981 - 1990)

001. Abello, R., & Bernaldez, F. (1987). Viewing strategies and attitudes at a nature conservation exhibition. The Journal of Environmental Education, 18(3), 1-6.

DESCRIPTORS: Environmental sensitivity, community resources, descriptive research, unobtrusive research, attitudes, conservation education, resource management education

VARIABLES: The analysis combined recorded observation time and attitudes of the subjects concerning the management of El Pardo, an area of protected land and wildlife.

PURPOSE: The study attempted to determine a correlation between viewing strategies during a conservation exhibition and the attitudes and sociological data associated with the viewers.

SUBJECTS: The researchers randomly selected 322 individuals who had just observed 18 photos contained in the El Pardo conservation exhibit.

RESEARCH DESIGN: The observation of viewing strategies was done by four people using stop watches to unobtrusively record time spent on each photo The photos in the public exhibition were large 100 x 60 cm color photos of El Pardo's natural features along with depictions of environmental problems in the area such as pollution and nearby crowded cities. The exhibition was designed to illustrate the environmental problems existing in an important natural area near Madrid. The visitors were given a 26-item questionnaire concerning attitudes related to El Pardo's management and possible uses of the now protected land. The items were answered with a Likert-type scale having 4 responses ranging from "fully agree" to "fully disagree". Sociological data was also gathered with the questionnaire.

RESULTS: The result of the timed observations was analyzed with principal component analysis. The results showed that the time spent observing each item was related mainly to the location of the item in the itinerary. The attitudes of the individuals did not seem to be correlated with time spent in the exhibit or interest in specific content of the photos nor were sociological characteristics related to the viewing strategies. Correspondence analysis was used to ordinate the subjects into four sectors, "permissiveness versus restriction" and "authoritarian versus participatory". The only relation identified between sociological characteristics and attitudes was the tendency for the oldest age group (59 years or older) to agree with authoritarian and anti-participative opinions in the policies for El Pardo's protected area.

REFERENCES: 22 cited

002. Adams, C., Biddle, B., & Thomas, J. (1988) Present status of environmental science in Texas public schools. Journal of Environmental Education, 19(3), 19-24.

DESCRIPTORS: Middle/junior high, secondary, descriptive research, formal, science education

VARIABLES: Grade level, subject matter, implementor, degree of use and factors preventing use of environmental science facilities outside the classroom, teaching materials used and needed, content areas emphasized, implementation difficulties and assistance needed.

PURPOSE: To examine the present status of environmental science (ES) in Texas school districts in terms of the above variables.

SUBJECTS: One hundred twenty-six science curriculum supervisors and 278 science teachers. 339 districts having at least one science-certified teacher were represented in the sample. Sampling error by district was ± 4 %.

RESEARCH DESIGN: The assessment instrument was constructed according to the procedures of Dillman, developed to address the six areas emphasis in the study objectives and was pretested in the winter of 1984. It was sent to the sample in the spring of 1985.

RESULTS: There were often discrepancies noted between the responses of teachers and supervisors. Supervisors reported that ES was most commonly taught in grades 7 and 8 while teachers reported grades 9 and 10. Both groups agreed that ES was most often taught as part of life, earth, and biological science courses and least often in a specific environmental study, outdoor education or social studies course. Both agreed that teachers were the primary implementors of ES courses. Nine types of facilities were listed in the assessment. Respondents were first asked if the facilities were available, and then whether they were used. The average reported availability of one or more facilities was 30% by supervisors and 23% by teachers. Utilization was reported as 22% and 13% respectively. Both groups agreed that no time in the curriculum schedule, no good time in the day, no funds for field trips, large class size,no suitable place to visit, administrative policy, and personnel shortages were the most to the least important factors preventing the use of facilities. The course textbook and self-prepared materials were the primary teaching materials reported. Supplemental materials were little used. Teacher lecture/discussion, textbook assignments and audiovisual presentations were the most frequently report techniques. The least used techniques were utilization of wildlife resources, field study, and community service projects. Both groups agreed that the most emphasized topic was "interrelatedness of living and non-living things," whereas "development of analytical skills and analysis techniques" were among the least emphasized. Examination of values was given the least attention. In Texas, ES programs have been implemented through infusion into existing curriculum offerings. Teachers ranked lack of appropriate outdoor and indoor facilities and curriculum materials as the most important difficulties related to ES implementation.

REFERENCES: 16 cited

003. Adams, C. E., Thomas, J. K., Newgard, L., & Cooper, C. (1987). How a biology curriculum affects students' wildlife orientations. The American Biology Teacher, 49(4), 208-211.

DESCRIPTORS: Ecology education, affective, experimental research, disciplinary, environmental sensitivity, attitudes, values, personal responsibility, resource management education

INDEPENDENT VARIABLES: Wildlife attitudes, perceptions, activities.

DEPENDENT VARIABLES: Action, satisfaction, frustration, apathy.

PURPOSE: To measure the effect of an introductory high school biology course, comprising less than 20% of the school day, on students' attitudes, perceptions, and activities concerning wildlife and, based on study results, provide recommendations in biology curriculum programming.

SUBJECTS: 113 high school biology students (experimental) and 94 (pre-test) and 113 (post-test) high school physical science (control) students enrolled during the 1983-84 academic year chosen on the basis of their demographic similarity and their different levels of involvement in the state-adopted biology curriculum.

RESEARCH DESIGN: The pre-test, post-test control group design was used. Student groups were chosen and a pre-test was given to both student groups the second week of the fall semester followed by a post-test the second to last week of spring semester. Data analysis was based on within- and between-group comparisons of pre- and post-test results. Illustration animals were the raccoon, robin, grass frog, and perch.

RESULTS: An academic year of exposure to the state-adopted biology curriculum contributed to significant attitudinal changes toward the four animals used in the survey collectively and individually. Attitudinal changes in biology students led to a change in their overall wildlife orientation from satisfaction to frustration based on no change of their activities component. The missing components in biology curriculum were those that promoted positive changes in students' perceptions of wildlife or provided opportunities to participate in wildlife-related activities. It was recommended that use of wildlife educators from a variety of sources and teacher participation in wildlife- related training programs to enhance teacher wildlife competencies be implemented.

REFERENCES: 7 cited

004. Aho, L., Permikangas, T., & Seppo, L. (1989). Finnish primary school children preferences in environmental problem solving. Science Education, 73(5), 635-642.

DESCRIPTORS: Citizenship action, elementary, descriptive research, knowledge, preferences, locus of control

VARIABLES: Perceived skills in use of environmental action skills, Environmental sensitivity, Knowledge of action skills

PURPOSE: To evaluate factors considered and methods used in solving environmental problems by primary school pupils to as to aid in developing the field of environmental education.

SUBJECTS: Pupils in the fourth (n=133) grade, and sixth grades (n=224)

RESEARCH DESIGN: The subjects were read 4 stories about despoiling problems, and were first asked to write a suggestion about solving the problem. They were then asked to fill in a form in which 5 possible solutions were presented to each problem. The alternatives were conservation, compromise, trusting technology, choosing economic profit, and stressing the family's ability to affect a solution. This study was done in an applied, descriptive survey form. No reliability figures were given.

RESULTS: The responses were classified into 8 different groups for the independent responses, and the alternative given proposals were scored. The researchers found that both cognitive and affective bases are used. Compromise and conservation were the preferred given alternatives, with technology ranking third, and both the economic viewpoint and family as the worst possible solutions. The sixth graders showed higher knowledge level, and preferred to use technology or move the source of the problem elsewhere. The fourth graders preferred conservation. Also, girls moved the cause of the problem elsewhere more than boys, and boys more often believed the problem could be allowed to exist.

REFERENCES: 8 cited

005. Albrecht, D., Bultena, G., Hoiberg, E., & Nowak, P. (1982). Measuring environmental concern: The New Environmental Paradigm Scale. The Journal of Environmental Education, 13(3), 39-43.

DESCRIPTORS: Affective, instrument development, descriptive research, rural, urban, perceptions/beliefs, attitudes, issue-based

VARIABLES: Public's opinion of an environmental world view - the New Environmental Paradigm, i.e. the desirability of restricting growth, protecting the integrity of ecosystems and of securing more harmonious relationships between man and nature.

PURPOSE: To test for the reliability, validity, and unidimensionality (measurement of a common attitudinal domain) of the New Environmental Paradigm (NEP), an instrument reported in 1978 by Dunlap and Van Liere.

SUBJECTS: Two separate samples of Iowa state residents were chosen for this study. The first group consisted of farm operators drawn from the population of all operators who had agricultural sales of at least $2,500 in 1976. Of 933 farmers who were sent questionnaires, 441 responded. Residents from the eight standard metropolitan areas (SMSA's) were chosen using a random dialing technique for the second sample. A response rate of 73% resulted in 468 returned questionnaires.

RESEARCH DESIGN: The NEP Scale was administered to each of the samples in the form of a questionnaire. The NEP Scale consists of 12 items which deal with an environmental world view, (e.g., limits to growth, steady state economy). Questions were arranged in a Likert-type format with respondents asked to "strongly agree," "mildly agree," "mildly disagree," or "strongly disagree," with each item. Each item was scored on a 4-point scale, with higher scores indicating greater acceptance of the paradigm. Eight items were worded such that agreement indicated acceptance of the NEP. Four items were worded so that disagreement indicated such acceptance.

RESULTS: Mean scores, Cronbach's alpha and factor analysis were used to analyze the data. Predictive validity was established by finding a significant difference between the mean scores of the urbanites and the farm operators. The urbanites score was higher by a magnitude similar to differences found in previous research on urban-farm orientations. The reliability of the NEP scale was measured using Cronbach's alpha which was calculated to the .66 for the farm sample and .78 for the urban sample. When the 12 items were submitted to factor analysis, 3 sets of items emerged for both the farm and the urban populations. An eigen value of 1 was required as the minimum criteria for factor identification. The three sub-scales seemed to measure orientations towards the balance of nature limits to growth and man over nature rather than a single dimension. Cronbach's alpha was calculated for each of the sub-scales on both populations and ranged from a low of .54 to a high of.71. Learsonian correlations between the responses on the three NEP Sub-scales showed only a modest relationship(ranging between .02 and .54) between the sub-scale score. Reliability and validity of the instrument seem to be established. Implications that these results have for using the NEP scale are discussed.

REFERENCES: 16 cited

006. Allen, C. T. (1982). Self-perception based strategies for stimulating energy conservation. Journal of Consumer Research, 8(4), 381-390.

DESCRIPTORS: Citizenship action, community resources, experimental research, investigation, perceptions/beliefs, locus of control/efficacy, behaviors, conservation education, energy education

INDEPENDENT VARIABLES: General feeling of effectiveness, perception of others, perceptions that others must act, perceived change in consumption, number of cases.

DEPENDENT VARIABLES: Attribute importance, energy responsiveness index, lottery choice.

PURPOSE: To generate self-perception based influence technique recommendations for stimulating socially conscious consumption.

SUBJECTS: 358 women recruited from various organizations in Columbus, Ohio. They were processed in a 4 x 3 randomized fashion with 3 control groups. 97% were married, 65% were between 35 and 55, 94% were between 25 and 65. 16% reported earnings over $30,000, 18% less than $15,000, and the remainder between $15,000 and $30,000.

RESEARCH DESIGN: The posttest only control group design was used. Subjects watched a videotaped program containing a conservation advertisement and then evaluated three hypothetical refrigerator/freezers. They were processed in a 4 X 3 randomized design featuring four levels of the promotion treatment and three levels of purchase price/energy efficiency tradeoff. Three control groups were also used to help control demand artifacts.

RESULTS: The attribution message produced a positive impact comparable to and, in the case of attribute importance, stronger than functional appeal. Subjects shown an attribution appeal believed they had changed their consumption to help with the nation's energy problem more than those shown the societal persuasive message. The attribution message yielded a positive effect and the persuasive appeal yielded nothing. The positive influence of the attribution message on all consumption-oriented measures indicates that self-perception based strategies delivered via television ads or other means merit further evaluation and can be effective.

REFERENCES: 29 cited

007. Andereck, K., & Gramann, J. (1989). The effect of a state education reform act on environmental education and interpretive facilities. The Journal of Environmental Education, 20(3), 15-19.

DESCRIPTORS: Environmental/nature centers, museums, secondary, descriptive research, field trips, outdoor education

VARIABLES: Marketing practices, government level, facility type, age of facility, facility density and annual budget, attendance, management and programming.

PURPOSE: To determine to what extent Texas House Bill No. 72 affected attendance, management, and programming at environmental education and interpretive facilities in Texas.

SUBJECTS: Leadership representatives at 182 environmental and interpretive facilities located in Texas. The included museums 36.8 percent, state administered areas 27.8 percent, federal areas 9.1 percent, zoos and aquariums 6.8 percent, observatories and gardens 5.7 percent, and 5 percent miscellaneous types.

RESEARCH DESIGN: Descriptive, a census of environmental education facilities in Texas was conducted following the passage of Texas House Bill 72 (H.B. 72). H.B. 72 restricted the ability of the public school teachers to take classes on field trips to off-campus educational centers. A questionnaire and follow-up mailings were sent to non-respondents using a method developed by Dillman (1978). Of 232 facilities, 182 responded for a response rate of 78.4 percent.

RESULTS: The research showed an association existed between changes in school-group and adaptation to H.B. 72. Facilities that experienced attendance declines in the twelve months following passage of the 1984 bill were significantly more likely to report having made programming and management changes in the 1986 survey (chi-square = 6.04, degrees of freedom = 1, significance = .014, Kendall's tau-b = .312). Although other facilities also reported adaptations, as a group those EE/I centers that were most heavily affected by the bill were most likely to adapt programming and management to improve attendance.

REFERENCES: 12 cited

008. Arcury, T., & Johnson, T. (1986). Public environmental knowledge: A statewide survey. The Journal of Environmental Education, 18(4), 31-38.

DESCRIPTORS: Issue awareness/knowledge of issues, cognitive, descriptive research, investigation, educational background, economic background, knowledge

VARIABLES: Levels of education, age, sex, total family income, metropolitan residence, state issues.

PURPOSE: To examine the general level of public environmental knowledge and analyze the sociodemographic characteristics correlated with such knowledge.

SUBJECTS: Six hundred eighty individuals were surveyed with a response rate (completed interviews/households contacted) of 64.3%. A random-digit dialing technique was used to insure an equal chance of every household with a telephone of being included. A random respondent selection procedure was used to select which household members 18 and older would be interviewed.

RESEARCH DESIGN: A telephone survey was utilized with random selection techniques. The survey consisted of five separate sets of environmental-knowledge questions. The first set used four items to assess environmental knowledge nationally, the second set used five items to assess energy knowledge nationally, the other three sets were geared to situations in Kentucky assessing general state environmental knowledge (4 items), causes of water pollution (5 items), and causes of ground water contamination (6 items).

RESULTS: Analysis proceeded in two stages. First, the general level of environmental knowledge was assessed and correct answers to the items were summed to create five scales. Next scales were determined. The results indicate that public environmental knowledge remains painfully low. Further, the major correlates of environmental knowledge are education, income, and sex. The need for a general purpose environmental knowledge instrument applicable to a large number of research situations and to a variety of populations was seen by the authors as a prerequisite for advancement in the field.

REFERENCES: 21 cited

009. Arcury, T., Johnson, T. & Scollay, S. (1986). Ecological worldview and environmental knowledge: The 'New Environmental Paradigm'. Journal of Environmental Education, 17(4), 35-40.

DESCRIPTORS: Model building, instrument development, descriptive research, educational background, economic background, knowledge, values, attitudes

INDEPENDENT VARIABLES: NEP scale, sex, age, income, education, and community size.

DEPENDENT VARIABLE: State knowledge about environmentally relevant issues.

PURPOSE: To provide a further empirical test of the conceptualization and approach (scale) of the New Environmental Paradigm (NEP).

SUBJECTS: Using a random digit dialing technique and a random respondent selection procedure, 441 Kentucky residents were contacted. The rate reflecting completed interviews was 69.7%.

RESEARCH DESIGN: The short, six-item version of the NEP was used (Continental Group 1982). Knowledge assessment was achieved by using a survey developed for the Division of Water, Kentucky National Resources and Environmental Protection Cabinet. Each of nine items on this self-report instrument were measured on a four-point scale.

RESULTS: Having a range of 6 to 24, the NEP scale achieved an alpha of .69. The knowledge survey had a range of 9 to 36 with an alpha of .85. Pearson's r and path analysis (using standard multiple regression procedures, and only reporting links with significant Beta coefficients [<.05]), indicate that the strongest direct effects on knowledge are income and education. The NEP score was also found to have an independent relationship to the knowledge score, which affirms the primary hypothesis of the study. Other direct or indirect variables had a lesser effect on knowledge scores. It is suggested that future research use an objective, rather than Likert-type, instrument to assess respondent knowledge.

REFERENCES: 19 cited

010. Ault, C., Jr., Novak, J., & Gowin, B. (1988). Constructing Vee maps for clinical interviews on energy concepts. Science Education, 72(4), 515-545.

DESCRIPTORS: Elementary, middle/junior high, cognitive, model building, descriptive research, trend analysis, energy education

VARIABLES: Thinking patterns of coherence and persistence in energy conceptions.

PURPOSE: To document the thinking patterns of coherence and persistence in energy conceptions.

SUBJECTS: A sample of 248 second grade students participated in an Audio-Tutorial, Elementary Science Program (ATESP). Cornell researchers followed the progress of 70 students from this group through two or more years of schooling, conducting interviews at two year intervals. Five interview transcripts from three students were selected for this study for energy Vee map analysis. The five interview transcripts were from two students during grades six and eight, and from one student during grade eight.

RESEARCH DESIGN: Data for the construction of energy concept Vee maps were selected from data from an ongoing study at Cornell University. Five interview transcripts from three students were selected for this study. Detailed Vee maps were created and analyzed to determine the thinking patterns of the students. A detailed procedure for putting an interview on a Vee map was described.

RESULTS: The Vee map analysis of "Adolph" in both sixth and eighth grades showed the predominant idea that energy is a material substance or fuel. Potential energy did not fit very well into Adolph's concept of energy. "Andrew" held some notion of potential energy in the sixth grade interview, considering it a property of gravity. He also had a notion of inertia, and a connection between the time gravity acts and the magnitude of its effect. Andrew had similar energy concepts in eighth grade but also added principles linking potential and mechanical energy, energy transfer, and work. The eighth grader, "Debbie", held views similar to Adolph and Andrew. She, too, did not differentiate energy from power or force and held that change stops when energy is used up. Like Andrew, she held the notion of potential energy-mechanical energy conversion.

REFERENCES: 20 cited

011. Bar, V. (1989). Children's views about the water cycle. Science Education, 73(4), 481-500.

DESCRIPTORS: Ecology education, elementary, middle/junior high, secondary, cognitive, program development, program implementation, descriptive research, formal, knowledge, science education, marine education

DEPENDENT VARIABLE: Children's level of understanding of concepts involved in water's phase changes.

INDEPENDENT VARIABLES: Children's ages and children's explanations of the water cycle.

PURPOSE: To assess the relationship between the children's explanation of the water cycle and the child's level of understanding of the concepts concerning phase changes.

SUBJECTS: Israeli children, ranging from 5 years to 15 years of age. The sample included equal numbers of boys and girls. Each group was picked at random from class lists, at the same school. Participants came from middle to upper-class backgrounds.

RESEARCH DESIGN: A descriptive-correlational research design was used to look at the relationship between age and view of the water cycle. Each child was tested using the clinical oral interview method (Piaget 1929; Piaget 1972). Validity of the instrument was not cited in the article.

RESULTS: The results of this investigation are easily understood in terms of the authors previous investigation of phase changes (Carry, 1985). That is, structure can be found within a child's ideas. At each stage of development, a child's explanation of the water cycle can be attributed to a structured scheme, combining level of understanding of conservation, views about phase changes, and "theory" concerning the water cycle.

REFERENCES: 16 cited

012. Barber, B., & Tomera, A. (1985) Is ecology being taught in general biology classrooms? A survey. School Science and Mathematics, 85(4), 285-297.

DESCRIPTORS: Ecology education, secondary, teacher education in-service, descriptive research, formal, beliefs, science education

VARIABLES: Current practices and beliefs regarding ecology education in the high school biology curriculum.

PURPOSE: To survey Illinois biology teachers regarding their teaching of ecology in general biology courses.

SUBJECTS: A randomly selected sample of biology teachers in secondary public schools of Illinois was chosen. The sample represented 20% of the total population and was stratified by educational regions.

RESEARCH DESIGN: A questionnaire was sent to the randomly selected teachers. A response rate of 69.33% was reported. The questionnaire gathered data on the following areas: textbook used, teacher evaluation of the textbook's presentation of ecology, degree of textbook utilization, use of instructional resource materials, instructional methods employed, teacher perception of the importance of ecology in the biology curriculum, ecological concepts taught, and environmental problems discussed.

RESULTS: The most often used instructional material for ecology teaching was reported to be the biology textbook. Lecture, discussion and textbook readings were the most commonly reported instructional methods. The two biology textbooks reported being used by a majority of Illinois biology teachers, Modern Biology and Biology: Living Systems, are also the two texts with the greatest percentage (over 32%) of their total concepts devoted to ecological concepts. Most Illinois biology teachers who reported following the text format find it necessary to supplement the text.

REFERENCES: 12 cited

013. Barman, C. R., Harshman, R. E., and Rusch, J. J. (1982). Attitudes of science and social studies teachers toward interdisciplinary instruction. American Biology Teacher, 44(7), 421-426.

DESCRIPTORS: Descriptive research, interdisciplinary, science education, social studies education, STS education.

VARIABLES: Present teaching assignment, gender, age, educational background, school building size, grade level teaching.

PURPOSE: To determine Wisconsin science and social studies teachers' interest in interdisciplinary instruction, their perception of current interdisciplinary approaches within their schools, and the preferred forms for learning more about interdisciplinary instruction.

SUBJECTS: Randomly selected science and social studies teachers, grades 6-12 in Wisconsin. Response rate was 33% (n = 198).

RESEARCH DESIGN: A panel of selected science and social studies public school teachers, state Department of Public Instruction consultants, and college methods instructors developed a 29-item questionnaire. The survey and cover letter was mailed to randomly selected teachers.

RESULTS: A t-test was performed to determine significant differences between science and social studies teachers on any on the questionnaire. A chi-square analysis was used to determine significant differences between individuals regarding other five variables. 77% of all science and social studies support integration of science and social studies as an important goal of education. 68.6% were undecided about their level of commitment to initiating programs to aid in integration. Over 90% of both groups believed that emphasis should be placed on interaction between science-technology-society (STS) and the impact of science and technology on the human and natural environment. Over 30% of both groups agreed with teaching specific social issues presented by the outcomes of scientific research. 60% of each group agreed on a base of commonality of inquiry approaches (many from the 6-9 grade level group). Nearly 75% of both groups selected school in-service as their preference for learning more about interdisciplinary instruction. Both groups also desired more materials for students emphasizing educational content. Results based on other variables were also discussed. Interpretation of data is presented. Implications for teaching were discussed. Specific planning needs were also presented.

REFERENCES: 8 cited

014. Barrow, L. H., & Germann, P. (1987) Acid rain education and its implications for curricular development: A teacher survey. Science Education, 7(1): 15-20.

DESCRIPTORS: Teacher education in-service, program development, program implementation, program evaluation, descriptive research, formal, issue-based, science education.

VARIABLES: Acid rain instruction, use of teaching resources.

PURPOSE: To determine the availability and use of resources for acid rain education.

SUBJECTS: Surveys were mailed to all teachers who had attended a workshop about or requested a copy of the Teacher's Resources Guide on Acid Precipitation with Laboratory Activities. 71 usable surveys were returned of a possible 202 (35.6% response rate).

RESEARCH DESIGN: Data were collected using a descriptive survey developed by the senior author. The survey was reviewed for content validity by three science educators. Subjects indicated whether they taught various topics in acid rain education, and marked a Likert scale to indicate their likelihood of using various acid rain resources.

RESULTS: Based on the average response of subjects, 62% of the teachers had taught acid rain during 1984-85, but only 20% of these teachers had acid rain in their text. Teachers that did not teach about acid rain indicated a need for curricular resources to help them develop units on acid rain. Respondents indicated a low-moderate priority for incorporating acid rain topics into the curricula. The researchers suggest that future acid rain curricula should be closely tied to current events and that students need to develop an awareness of the interrelated nature of the global environment.

REFERENCES: 10 cited

REPEAT
Barrow, L., & Germann, P. (1987). Acid Rain Education and Its Implications for Curricular Development: A Teacher Survey. Science Education, 71(1), 15-20.

DESCRIPTORS: Science education, STS education, descriptive research, middle/junior high school, cognitive, program development, program implementation, formal, investigation, marine education, inter-disciplinary.

VARIABLES: Number of hours of acid rain education taught in the 84-85 school year using "Teacher's Resource Guide on Acidic Precipitation with Lab Activities."

PURPOSE: Assess current number of hours spent on acid rain education.

SUBJECTS: Individuals who attended a workshop or requested a copy of the "Teacher's Resource Guide on Acid Precipitation with Lab Activities" in March and April of 1985.

RESEARCH DESIGN: A descriptive-survey research design was used. The survey was reviewed by three science educators for content validity. Survey's were processed according to Berty's (1979) guidelines. Data was analyzed by SPSSX.

RESULTS: There was a 35.6% response rate from the mailing. Respondents were

34% female, 66% male. Sixty-two percent of respondents taught acid rain during the 1984-85 school year. Two-thirds taught up to 3 hours on the topic. Based on the research, the authors recommend that future acid rain curricula needs to have a direct connection with current events. They also state that greater emphasis needs to be placed on meteorological interactions involved and students need to be made aware of ways to reduce acid rain. Topic areas are mentioned in the study where acid rain education can be incorporated into the existing curricula. It was found that teachers who currently teach acid rain need support materials, while those that don't need curricular resources. Textbook publishers and science curricula developers need to include acid rain as a component in the science curricula.

REFERENCES: 10 cited

015. Barrow, L., & Morrisey, J. (1988-89). Energy literacy of ninth-grade students: A comparison between Maine and New Brunswick. The Journal of Environmental Education, 20(2), 22-25.

DESCRIPTORS: Secondary, teacher education in-service, descriptive research, formal, educational background, knowledge, attitudes, energy education

VARIABLES: Maine and New Brunswick ninth-grade students' knowledge about energy.

PURPOSE: To determine if there is any relationship between knowledge about energy and gender and geography among ninth-grade students in Maine (United States) and New Brunswick (Canada).

SUBJECTS: Nineteen randomly selected schools in Maine (n = 11) and New Brunswick (n = 8) provided a total of 981 ninth-grade students. In Maine (n = 429) 233 students were males and 185 were females. Eleven students had no indication of gender. In New Brunswick (n = 452) 216 students were males and 222 were females. Fourteen had no indication of gender.

RESEARCH DESIGN: A mailed questionnaire, Test of Energy Concepts and Values (TECV), was used to collect data on ninth graders' knowledge and attitude about energy. The TECV was modified by the researchers to meet SI standards of metrication and to reflect the current energy status in Canada. TECV was validated with reliability estimates reported for attitudes and knowledge items. The TECV was administrated by participating ninth-grade teachers in the second term of the 1983-84 school year. Validity threats were acknowledged.

RESULTS: Independent t-tests were used to measure statistical differences. The level of significance was not reported. Results indicated that Maine ninth graders had a significantly greater energy literacy than New Brunswick ninth graders. Male students' energy literacy scores were significantly greater than the females' in both locales. For Maine students, males had a significantly greater score than females for both the lowest and highest quartiles. For New Brunswick students, females outscored males in the lowest quartiles and the pattern was reversed in the highest quartiles. Although the researchers supported the assumption that energy education efforts (in-service and curriculum development) had resulted in more energy-literate ninth grader students than those undertaken in New Brunswick, the overall results indicated that previous energy education efforts generally had been ineffective in producing energy-literate students.

REFERENCES: 21 cited

016. Bascombe, M.J., & Webb. J. (1981). Newspaper coverage of energy issues. Media Information Australia. 20, 9-14.

DESCRIPTORS: Issue awareness/knowledge of issues, community resources, descriptive research, issue-based

VARIABLES: Concerns over energy issues, objectives of energy matters, coverage and location of energy issues, and frequency of issues reported.

PURPOSE: To analyze energy issues covered by a newspaper with regard to their content, coverage, location, and source of views reported.

SUBJECTS: The 'West Australia' daily newspaper, of which 103 copies were selected between February 1 and June 5, 1980. Articles on energy issues were selected specifically.

RESEARCH DESIGN: This descriptive study analyses all newspaper articles, reports, features, editorials and letters, over a four month period that included energy issues. Location within the paper was determined. The source of each article was determined to decide which various issues were of concern to different societal groups, and how these groups reported their different objectives for energy management.

RESULTS: There were 287 articles selected, and the energy issue, geographic location, page location, and column size of each article was determined. Some 14 different energy issues were covered. The origin of 24.4% of the articles was from overseas, with 40.4% from Western Australia and 24.4% from other Australian states. The majority of the articles were editorials or letters to the paper. A frequency matrix was given for the reporting of objectives by different institutions, such as governments, industry, and other individuals. Objectives ranged from the use of alternate energy as the major objective to the export of energy as the most minor. A frequency matrix of concerns from these groups was also given. Nuclear power was the most covered topic and energy conservation was the least covered. Although only 0.41% of the newspaper was given to coverage of energy issues, these articles were given prominent locations. It could not be determined if the actual energy concerns of each group were the same as those reported by the newspaper, and if equal reporting was given to all groups on all issues. It was concluded that the reporting of energy concerns in this newspaper may not completely reflect the real views of the different groups and individuals.

REFERENCES: 13 cited

017. Becker, L. J., Seligman, C., Fazio, R. H., & Darley, J. M. (1981). Relating attitudes to residential energy use. Environment and Behavior, 13(5), 590-609.

DESCRIPTORS: Experimental research, perceptions/beliefs, preferences, attitudes, behaviors, energy education

VARIABLES: Attitudes about thermal comfort, people's perception of the reality of the crisis, state of family finances, energy consumption, health.

PURPOSE: To examine the relationship between homeowners' attitudes and their winter gas consumption.

SUBJECTS: Fifty-five couples, who had been participants in Seligman et al.'s "summer survey", participated. In addition, another sample of 250 households was selected randomly from those households that had listed telephone numbers. Of this group, 184 households agreed to fill out the winter questionnaire. Thirty-two of the 184 households were excluded because questionnaires were not returned by both spouses or because a complete set of gas meter readings could not be obtained for them. The final sample consisted of 207 couples. The respondents were largely middle class professionals in their mid-thirties. The great majority of respondents had a college education, and a median family income in the 20-25 thousand dollar range. The typical family had two young children and lived in a two- three- or four-bedroom townhouse. The townhouses were identical in floor (excluding the number of bedrooms) and living space and all had central air conditioning.

RESEARCH DESIGN: The questionnaire contained a total of 52 questions mainly concerned with questions designed to tap the respondents' opinions and attitudes about a variety of energy-related matters. Both spouses were required to fill out a questionnaire individually, which was dropped off at their home. All of the questionnaires were distributed and picked up from the respondents' homes with a two-week period.

RESULTS: The 46 attitudinal questions were subjected to a principal factor analysis with squared multiple correlations used as communality estimates. Twelve factors were extracted with eigen values greater than one. It was found that the best predictor of residential energy consumption is the one involving attitudes about thermal comfort and energy use. The less the couples were willing to put up with being chilly or inconvenienced in order to save energy, the more gas the household consumed. Other important predictors were optimism as to whether or not there was a solution to the energy crisis, and whether the respondents felt that a chilly house had a deleterious impact on family health in the winter. More energy was consumed if respondents were optimistic about a solution to the crisis and if respondents felt their family's health would suffer.

REFERENCES: 15 cited

018. Bedwell, L. (1984). Environmental education attitudes of biology students, teachers, and administrators. The Journal of Environmental

Education, 16(1), 20-22.

DESCRIPTORS: Secondary, attitudes, hypothesis generation, descriptive research, non-formal, preferences, science education

VARIABLES: Ranking of 5 major goals of biology instruction, with emphasis given to a social/environmental goal. Group membership: biology teachers, college preparatory biology students, non-college preparatory biology students, and public school administrators.

PURPOSE: To answer the following questions: 1) Do biology teachers, college preparatory biology students, non-college preparatory biology students, and public school administrators differ significantly in their ranking of the major goals of biology instruction?, and 2) Are there significant differences in the relative ranking of a social/environmental goal by the four groups?

SUBJECTS: Six high school principals, eleven high school assistant principals, eleven high school biology teachers, 30 randomly chosen college preparatory biology students, and 30 randomly chosen college preparatory biology students from a large county school district in South Carolina.

RESEARCH DESIGN: From a randomly ordered goal statement survey, subjects were asked to rank each goal statement in order of importance using a five point Likert-type scale. Directions in the survey indicated that there were no right or wrong answers. The Friedman Test was computed to test the significance of the differences in ranks.

RESULTS: The results of the test were not statistically significant. The four identified groups of individuals did not differ significantly in their ranking of five biology instructional goals. The Friedman test did, however, indicate that the respondents perceived differences among the goals as expected. The goal dealing with social/environmental issues was placed fourth in importance by the groups surveyed.

REFERENCES: 5 cited

019. Belk, R., Painter, J., & Semenik, R. (1981). Preferred solutions to the energy crisis as a function of causal attributions. The Journal of Consumer Research, 8(3), 306-312.

DESCRIPTORS: Citizenship action, descriptive research, perceptions/beliefs, preferences, locus of control, energy education.

INDEPENDENT VARIABLES: Attributions of energy shortages (i.e., general public, foreign oil producers, U.S. government, oil companies).

DEPENDENT VARIABLES: Preferred solutions to energy shortages (i.e., voluntary conservation, government enforced conservation, government pressure on oil companies, no action).

PURPOSE: To determine if a relationship exists between perceptions of the causes of energy shortages and the preferred type of solution - personal or non-personal.

SUBJECTS: In study 1, concentrating on the gasoline shortage, subjects were 253 systematically selected heads of households within 20 to 30 randomly selected census tracts in Salt Lake City who traveled over 140 miles by automobiles each month. In study 2, concentrating on the home heating fuel shortage, subjects were 359 heads of households within 20 to 30 randomly selected census tracts in Salt Lake City who paid their own heating bills and were able to control their thermostat settings. Response rate was over 90 percent.

RESEARCH DESIGN: A descriptive survey was used. In both studies, subjects were interviewed regarding their perceptions of the cause of energy shortages and preferred solutions. Validity and reliability data were not reported.

RESULTS: Data were analyzed using Chi-square and Duncan's multiple range test (alpha = 0.05). In study 1, it was concluded that those who attributed the energy shortage to a personal cause favored personal solutions more than those who attributed energy shortages to non-personal causes. It was also concluded that those who attributed the energy shortage to non-personal causes favored non-personal solutions more than those who made personal attributions. Study 2 conclusions were similar to those in study 1. Research recommendations and energy policy implications were described.

REFERENCES: 28 cited

020. Bennett, D. B. (1982). Evaluating environmental education in the context of a junior high school state studies program. The Journal of Environmental Education, 13(4), 13-18.

DESCRIPTORS: Citizenship action, middle/junior high, secondary, psychomotor, cognitive, affective, program evaluation, experimental research, multi-disciplinary infusion, formal, social studies education.

INDEPENDENT VARIABLE: Maine's State Study (Social Studies) Curriculum.

DEPENDENT VARIABLE: Achievement of social studies understandings.

PURPOSE: To evaluate the effectiveness of the Maine's State Studies Curriculum to attain its major objective student achievement in the area of social studies understandings and skills.

SUBJECTS: The experimental groups consisted of 875 students from 15 schools which piloted the curriculum material and the control group consisted of 353 students from 8 schools. The schools were widely scattered geographically throughout Maine's 16 counties. Educational situations reflected a diversity of cultural differences, student backgrounds, different teaching and learning styles, and varied learning environments.

RESEARCH DESIGN: A pretest-posttest control group design was used in this pilot study. Control groups received the normal social studies program offered in their schools. Experimental groups were taught a nine week course incorporating 24 activities. This course was representative of the full year curriculum which contains 82 learning activities. The regular classroom teachers administered the tests simultaneously after a participation in a pilot testing workshop designed to familiarize teachers with teaching guides, instructional materials, student readings, and evaluation packets. Tests were administered before and after the nine week version of the course. Achievement was measured by a 50-item objective test based upon the instructional objectives. Content validity was established using 35 junior high school teachers ratings of the test items. Test-retest reliability was .81 (n=104) over a two-week span. Kuder-Richardson #21 reliability of the pretest was .80 (n=1314) and for the posttest .90 (n=1314).

RESULTS: All data were analyzed by a third party. Analysis of variance indicated that the experimental group mean on the posttest, 30.19, was significantly higher than the pretest mean, 24.50. The control group posttest mean was 24.14 and the pretest mean was 24.99. Analysis of Covariance was computed on the post-test scores with the pretest score used as the covariate. An F of 100.16 was significant beyond the p<.001 level. Pretest scores of experimental and control groups were found not to be significantly different (F=0.12). Analysis of Variance of posttest scores of both experimental and control groups showed significant difference (F=8.69, p<.01). It was concluded that state studies can be a viable avenue for infusion of environmental education into our schools.

REFERENCES: None cited

021. Bialeschki, M. D. (1981). Environmental education needs of special populations. The Journal of Environmental Education, 13(1), 38-44.

DESCRIPTORS: Program development, program evaluation, descriptive research, non-formal, preferences

VARIABLES: Agencies and consumers involved in environmental education (EE) for special populations; program offerings; consumer preferences; and participation problems.

PURPOSE: (Conducted by the Minnesota Department of Natural Resources) to assess the present activities, offerings, needs, and problems encountered by consumers involved in EE and interpretation programs for special populations offered by agencies located in the Minneapolis - St. Paul metropolitan region.

SUBJECTS: Interviews were conducted with forty-six (46) agency administrators, and seventy (70) consumers. Most of the agencies were within the seven county Minneapolis - St. Paul area.

RESEARCH DESIGN: A selective stratified sampling was done to obtain a representative group of metropolitan area agencies, and to identify consumers involved in EE for special populations. Data collection was done by personal interview. The main focus of the interviews was to acquire a data base regarding: 1) Present and future percentages of EE programs offered by special population agencies; 2) EE activity preferences of special population consumers; 3) General problems encountered by special populations in EE activities as perceived by agency programmers; and 4) EE problems as perceived by the consumers. Validity and reliability estimates were not reported.

RESULTS: The data obtained for each of these variables were independently calculated as percentage and presented in graphic format. Findings with respect to these data were discussed. Nature interpretation and historical interpretation represented the most frequent types of agency programming. Projections of future program desirability showed that this trend would continue. The responses by consumers were so similar that separation into subgroups, (i.e. by particular handicaps) was not warranted. The top three consumer activity preferences were found to be: nature trails, animal study, and looking at displays. Lack of information was reported as the foremost (85 percent) problem by agency programmers, and as the second greatest (59 percent) problem by consumers. Consumers indicated the need for better transportation as their foremost problem. Generalizations, educational implications and six (6) specific recommendations were stated by the authors.

REFERENCES: 16 cited

022. Birch, S., & Schwaab, K. (1983). The effects of water conservation instruction on seventh-grade students. The Journal of Environmental Education, 14(4), 26-31.

DESCRIPTORS: Issue awareness/knowledge of issues, middle/junior high, teacher education in-service, program evaluation, experimental research, knowledge, attitudes, conservation education

VARIABLES: Independent variable: instructional unit on water conservation.

DEPENDENT VARIABLES: Knowledge of water conservation practices and attitudes toward water use.

PURPOSE: To evaluate the effectiveness of a water conservation instructional unit in increasing students' knowledge of water conservation practices and influencing their attitudes about efficient water use.

SUBJECTS: Four groups of seventh-grade students in compulsory Life Science classes. Two treatment groups (n=522) and two control groups (n=321) were employed.

RESEARCH DESIGN: The researchers report the use of a true experimental, Solomon 4-group design. Subjects in the experimental group were instructed in a unit on water conservation by teachers who voluntarily attended a district workshop. Control subjects received regular instruction by teachers who had not attended the workshop. A two-part instrument was developed to assess effectiveness of instruction using multiple choice and Likert-type questions. A panel reviewed instrument content to assure validity. Test-retest reliability was established as r = .39 using Kuder-Richardson formula 20.

RESULTS: One and two-sample t-tests, analysis of variance, and Pearson r computations were utilized. Each of three hypotheses were rejected at significant levels (p<.0001), showing that students' knowledge and attitudes about water use could be changed by exposure to this water conservation instructional unit. While statistical significance was shown, the authors question the practical significance of the knowledge test score differences. The one week time constraint on the instructional unit was also cited, and the authors suggest a more lengthy study be attempted. Additionally, some type of setting that would allow actual observation of water conservation behaviors of students was suggested: The instructional unit, and teachers' workshop have been modified since this study, and curriculum kits are available from the overseeing research center.

REFERENCES: 12 cited

023. Blocker, T. J., & Koske, P. R. (1984). Household income, electricity use, and rate-structure preferences. Environment and Behavior, 16(5), 551-572.

DESCRIPTORS: Experimental research, economic background, preferences, behaviors, energy education

VARIABLES: Present electricity use, family income, and rate-structure preferences.

PURPOSE: To investigate cost versus comfort considerations in household conservation decision-making.

SUBJECTS: A sample of 1500 households was chosen by company officials from the customer files of the major electric utility companies in the state. By picking every 400th file following a random start, the officials were able to ensure that every household had an equal probability of being selected for the sample.

RESEARCH DESIGN: Mailed questionnaires were sent requesting information on energy use, energy conservation and demographic data. Subjects rated their preferences for different conservation-promoting rates: time-of-day rates, seasonal rates, and interruptible rates. Data was based on 852 owner-occupied, single-family households. Actual kilowatt-hour use information was provided by the utility companies. Non-respondents did not differ significantly from the total sample. The appropriate statistical technique was log-linear modeling.

RESULTS: Family income had an effect on the respondents' preferences for time-of-day, seasonal, and interruptible rates. The factors that predict energy use may depend on the degree of trade-off between cost and comfort. The data for time-of-day rates support the argument that price incentives may encourage conservation, even among more affluent households, when the comfort sacrifice is minimal. However, these households would likely suffer a potential sacrifice inconvenience. At the same time, however, the data for seasonal and interruptible rates support the idea that the affluent would prefer to purchase their comfort, even if prices are high. Higher-income families might be willing to cut back or shift electricity use, if this could be accomplished in such a way that the comfort and convenience dimensions of their lifestyle were not harmed seriously. Further research is needed to determine if thermal comfort may be one aspect of a larger, more complex set of lifestyle factors.

REFERENCES: 27 cited

024. Blum, A. (1981). A survey on environmental issues treated in science education curricula, before and after 1974. Journal of Research in Science Teaching, 18(3), 221-228.

DESCRIPTORS: Issue awareness/knowledge of issues, secondary, cognitive, program development, descriptive research, formal, directed instruction, knowledge, science education, issue-based.

INDEPENDENT VARIABLE: Publication date of environmental science education (ESE) curricula: before 1974 or from 1974-77.

DEPENDENT VARIABLES: Differences in curricula with regard to: use of experiments, target populations, preparation of learning materials/teaching materials, environmental topics, controversial issues, decision making, use of systems analysis.

PURPOSE: To survey if ESE projects actually use methods typical for science education, mainly experimental investigations, and to what extent the topics treated in the curricula represent the thinking of the environmental education community in the two time periods.

SUBJECTS: Developers of ESE projects produced before 1974 and between 1974 and 1977 were analyzed to identify developmental patterns of EE. A total of 42 surveys were distributed and 39 project descriptions were returned. The response percentage for pre-1974 was 72% and for 1974-1977, 79%. The pre-1974 n= 39 and the 1974-77 n= 17. Projects were screened for project descriptions identified in the 9th Clearinghouse report for indication of EE elements defined by IUCNNR, the Environmental Education Act of 1970, and the Belgrade Charter.

RESEARCH DESIGN: An ex post facto survey and project descriptions were used. The survey was based on the identification of relevant ESE projects and a questionnaire containing the research questions. The replies of the projects returned were analyzed separately to identify possible developmental patterns. Content reliability was measured by comparing submitted ESE projects to ones which already published learning/teacher materials to refute or substantiate the subjects' statements. The ESE projects and their descriptions were content validated by three independent experts who all agreed that they correspond to the EE definitions mentioned in the study.

RESULTS: Nine trends were identified with the study. Between 1974 and 1977, more science education programs indicated EE as one of their subject areas. ESE projects tend to develop their materials based on an experimental approach. ESE projects tend to develop more materials for students than teachers. More emphasis is now put on the implementation of existing curricula, thus helping the science teacher who is not an environmental specialist. Conservation, use of resources and improvement of quality of life were dealt with in nearly all ESE projects surveyed before 1974; ecology and energy were interests in 1974-1977. Water and air pollution were most popular before and after 1974. Cover-all-problems survey programs have switched to more specialized ones concentrating on fewer environmental issues. The main controversial issues before and after 1974 were conservation of nature and use of resources, improving quality of life, nuclear hazards and the energy crisis (of 1973). Over 80% of the projects think Systems Analysis and Decision Theory should be included in EE, but only a small amount actually plan on using them in the future.

REFERENCES: 12 cited

025. Blum, A. (1981). Effect of an environmental science curriculum on students' leisure time activities. Journal of Research in Science Teaching, 18(2), 145-155.

DESCRIPTORS: Environmental sensitivity, middle/junior high, affective, program evaluation, experimental research, formal, inquiry/investigation, science education

INDEPENDENT VARIABLES: Use of "Let's Grow Plants," an agricultural Environmental Science curriculum.

DEPENDENT VARIABLES: Five leisure time activities: doing homework, reading, observing, growing and experimenting with plants, all measured at three levels of student or teacher initiative.

PURPOSE: To assess the impact of an environmental science course on students' behavior outside of school.

SUBJECTS: One experimental group and one control group of teachers and 7th grade students from all parts of Israel were used. Teachers responding to an initial questionnaire numbered 108. The teacher experimental group n was 15, while the teacher control group n was 13. The student experimental group n was 480, while the student control group n was 490. Teachers were chosen using five criteria which determined experimental or conventional teaching methods: certification in agriculture/nature studies, adequate performance evaluation, two years experience and teaching in a state school with a land laboratory.

RESEARCH DESIGN: A pretest-posttest comparative group design was used. Subjects in the experimental group used the "Let's Grow Plants" text which posed problems in the form of open-ended questions and encouraged students to find solutions through experimentation. Subjects in the control group were also given the same text, but instead of open-ended questions and suggestions for experimenting, they were given information in factual form only. A dummy control curriculum was devised to enable a valid comparative evaluation. Self-reports of leisure activities by the students were identified on a 15-item Active Interest Questionnaire. Construct validity of the questionnaire was affirmed by using Guttman's Smallest Space Analysis. The test-retest reliability was .76.

RESULTS: Activity frequency ratings were used to measure statistical differences between the treatment and comparison groups. The alpha level was selected at <.01. An increase was reported in all activities among experimental students, whether on the initiative of the students or teachers, while a decrease in activities was reported for the control group. The largest increase in the experimental group was in experimenting at home and reading the student text. The control group showed no increase in reading initiative and experimenting on their own. Control students grew plants at home less often and reported fewer plant observations.

REFERENCES: 17 cited

026. Blum, A. (1982). Assessment of subjective usefulness of an environmental science curriculum. Science Education, 66(1), 25-34.

DESCRIPTORS: Ecology education, secondary, program evaluation, ex post facto research, case study, environmental sensitivity, science education

INDEPENDENT VARIABLE: Method of teaching high school agriculture: An environmental science approach vs. the traditional approach.

DEPENDENT VARIABLE: Student assessment of agriculture as useful.

PURPOSE: To determine whether students' attitudes toward the usefulness of agriculture would change if the subject were taught as open-ended inquiry into applied science.

SUBJECTS: 375 agricultural High school teachers from Israel were surveyed to identify classrooms that were using the new method of teaching agriculture (AES) and to find those classrooms where students are taught in a traditional way. From the 375 teachers surveyed, only 108 responses were received. Of the 108 responses, 68 classrooms were identified as teaching the new AES method while the other 40 were taught in a traditional mode. After screening the respondents, 17 AES teachers with 480 students and 15 traditional teachers with 490 students were chosen.

RESEARCH DESIGN: A non-equivalent control group design was used. The experimental group received the new AES curriculum, while the control group received traditional instruction concerning agriculture. Both groups were exposed to this method of teaching for a year. At the end of the school year, students were surveyed concerning the perceived usefulness of agricultural education. Questionnaire reliability was verified by giving a group of students the same questionnaire again. The results were a test-retest reliability of .76.

RESULTS: The author found significant differences between the two groups. (p < .01) This supported the hypothesis that the introduction of an inquiry type curriculum can change students' perceptions of usefulness of a school subject. Students who were taught the new AES found that agriculture can fit into their lives and leisure time, and their attitude toward the environment was changed somewhat positively. An uncontrolled variable which could affect this research is teaching ability. It is thought that teachers who adopt new curricula may be better teachers than those who do not. Further study is needed in this direction.

REFERENCES: 12 cited

027. Borden, R. (1984-1985). Psychology and ecology: Beliefs in technology and the diffusion of ecological responsibility. The Journal of Environmental Education, 16(2), 14-19.

DESCRIPTORS: Higher education, affective, descriptive research, perceptions/beliefs, attitudes, personal responsibility.

INDEPENDENT VARIABLE: Attitudes of individuals who engage in environmentally responsible activities (rated as low, moderate, high).

DEPENDENT VARIABLE: Evaluative dimension scores for semantic differential test (using five attitude-concept clusters).

PURPOSE: To assess the interrelationships among the broadly defined themes of pollution, technology, and nature and their joint motivational contribution to the totality of an individual's environmental behaviors.

SUBJECTS: Using Maloney, Ward, & Braucht's Actual Commitment scale, 530 male and female college students were rated as low, moderate, or high as to their action levels concerning environmental behavior. From these, 42 were selected from the lower quartile, and 47 from the upper. In addition, 31 students in a specialized human ecology program were given the test, and their scores substantially exceeded the existing upper level. This group was designated the 'high' level group.

RESEARCH DESIGN: Once subjects were classified according to their action levels, they were given a semantic differential test that rated five attitude concepts (pollution, science, nature, environment, technology). Using a 7 point Likert-type scale, six pairs of dichotomous adjectives (good-bad, etc.) were given in each category. No validity or reliability measures were mentioned for the instrument.

RESULTS: Using factor analysis, intercorrelation, and multiple regression analysis to interpret the data (p<.05, p<.01, p<.001 values reported), it was found that the two most important predictors of environmentally responsible behavior were the attitudes towards technology and pollution. These two accounted for nearly 40% of the variance observed. Additionally, the author concludes that at least a part of the inhibition involved in environmental irresponsibility, is akin to the diffusion of responsibility model where assumptions are made that someone or something else will solve the problem.

REFERENCES: 33 cited

028. Bridgewater, P., & McDonald, R. (1983-84). Evaluating multidisciplinary programs: Pragmatic approach. The Journal of Environmental Education, 15(2), 28-31.

DESCRIPTORS: Higher education, cognitive, program evaluation, descriptive research, multi-disciplinary, interdisciplinary, perceptions/beliefs, attitudes

VARIABLES: Attitudes toward a multi-disciplinary program (e.g., Population and World Resources program [PWR]).

PURPOSE: To assess students' perceptions of the core courses in University's (Perth, Australia) PWR degree program.

SUBJECTS: Subjects were students enrolled in Murdoch University's PWR degree program. The number of students involved in the study was not reported.

RESEARCH DESIGN: The researchers briefly outlined three curriculum evaluation methods - the grid/checklist approach, assessment of student's competencies/opinions, and student survey. In using the survey technique, the researcher first translated the aims of the PWR program into six areas of knowledge and understanding. This was done through analysis of descriptions of the program in the University Handbook, core course descriptions and dialogue between the researchers themselves. Students were then asked to rate how well each of the core courses covered each of the six areas. Ratings for the core courses were determined using a questionnaire that employed 3-point Likert-type responses.

RESULTS: Potential use of histograms in guiding discussions on the desirability of maintaining a course was briefly discussed. However, descriptive statistics related to the students' perceptions of how well the core courses cover each area of the degree program was not included. In curriculum evaluation, apart from the grid/checklist approach and evaluating expected changes in students' competencies and opinions, the researches' concluded that "Results for the student survey helped to provide the multidisciplinary framework necessary for discussions designed to initiate cooperative efforts between the staffs and students in program development.

REFERENCES: 8 cited

029. Brockmeyer, F., Bowman, M., & Mullins, G. (1982-83). Sensory versus non-sensory interpretation - a study of senior citizens' preferences. The Journal of Environmental Education, 14(2), 3-7.

DESCRIPTORS: Adult/Continuing Education, affective, experimental research, non-formal, environmental sensitivity, preferences, outdoor education

INDEPENDENT VARIABLES: Nonsensory hikes, using only verbal exchange and avoiding sensory involvement.

DEPENDENT VARIABLES: Sensory hikes, where sensory involvement was encouraged both verbally and by modeling sensory related behavior.

PURPOSE: To determine if there was a difference in the interest and enjoyment of senior citizens participating in sensory versus non-sensory hikes.

SUBJECTS: There were seven randomly selected groups of senior citizens with a total number of 60 individuals involved. There were 35 members in the group that had a sensory hike and 25 in the group that took a non-sensory hike.

RESEARCH DESIGN: Experimental research with random selection of groups. Data collection techniques were by means of questionnaires based on enjoyment, interest, and recall.

RESULTS: The chi-square test of independence, the t-test of significance for independent samples and Pearson's product-moment correlation were the measures utilized. The alpha level was set at 0.05. The nonsensory hike had a great deal of merit for groups that enjoy strong social interaction and the sensory hike assets were higher enjoyment as well as a more environmental and self awareness. A number of variables were recommended for consideration in future research in this area.

REFERENCES: 6 cited

030. Brody, M., Chipman, E., & Marion, S. (1988-1989). Student knowledge of scientific and natural resource concepts concerning acidic deposition. The Journal of Environmental Education, 20(2), 32-34.

DESCRIPTORS: Descriptive research, issue awareness/knowledge of issues, elementary, middle/junior high school, secondary, cognitive, formal, knowledge.

VARIABLES: Scientific and natural resource knowledge, grade level.

PURPOSE: To assess the level of scientific and natural resource knowledge that fourth, eighth, and eleventh grade students in Maine possess concerning acidic decomposition.

SUBJECTS: A sample of 175 public school students in the 4th (n = 53), 8th (n = 53) and 11th (n = 69) grades from Maine. Rural and urban areas were both well represented. Schools were selected by interviewer proximity and classes were selected by teacher and student willingness to participate. The sample is believed to be representative of a fairly heterogeneous population. Approximately equal numbers of both genders were represented.

RESEARCH DESIGN: Twelve content principles considered critical to a full understanding of acid deposition were identified using concept mapping. These included geological, meteorological, ecological, political and economic concepts. The twelve concept principles were subdivided into 56 specific concepts. Modified clinical interviews were conducted with the subjects. The interviews were taped, and the tapes scored on a scale of complete, high partial, low partial, or no understanding of the 56 concepts. Common misconceptions were also noted. Inter-rater and intra-rater reliabilities are discussed.

RESULTS: Generalized correct concepts of current student knowledge are reported, as well as missing concepts. Significant grade level differences are discussed. The implications of student knowledge and misconceptions are also discussed.

REFERENCES: 17 cited

031. Bruening, T. H. (1991). Communicating with farmers about environmental issues. Journal of Applied Communications, 75(1), 34-41.

DESCRIPTORS: Issue awareness/knowledge of issues, descriptive research, rural, perceptions/beliefs, preferences,

VARIABLES: Perceived seriousness of environmental issues (fertilizers, pesticides, soil conservation, water quality); perceived usefulness of communication methods for learning about environmental issues (county & local meeting, field demonstrations, magazines, on-farm consultations, discussions, printed materials, TV/videotapes, trade shows & fairs, radio, visual materials); and perceived usefulness of human resources for learning about environmental issues (Cooperative Extension Service, ISU Extension Specialists, local seed/chemical/fertilizer dealer, machinery dealers, neighbors & friends, other /ASCS, soil conservation district directors, Soil Conservation Service, agriculture teachers).

PURPOSE: To identify which sources of information about environmental issues farmers consider useful, and to determine how serious they believe environmental issues to be.

SUBJECTS: A random sample of Iowa farmers stratified by county was selected. The mean education was 12.7 years, mean farming experience was 23 years, and mean property size was 196 acres. No-till or ridge till planting systems were used by 11% of the subjects.

RESEARCH DESIGN: This was a descriptive survey. The four-part mailed questionnaire included five-point Likert-type items and questions about the farming practices in use. The content validity was determined by an expert panel. A pilot test was used and instrument reliability was reported. Four follow-up mailings were sent to non-respondents. A t-test comparing early and late respondents was used to check that non-respondents did not differ significantly from the sample.

RESULTS: Mean scores only were reported. On average, farmers somewhat agreed that pesticide use was a serious issue. They were less certain about soil conservation, fertilizers and water quality. Field demonstrations, followed by local and county meetings, were considered the most useful communication method; radio, discussions and on-farm consultations were the least useful. Mean scores ranged from 3.42 to 4.03, where 1= "of no use" and 5="very useful." The Cooperative Extension Service, local seed/chemical/fertilizer dealer, Soil Conservation Service, neighbors and friends, and ISU Extension Specialists were rated the most useful human resources. The former had the highest mean score (3.96). The lowest mean score (3.05) was for machinery dealers. The statistical significance of the differences was not calculated. Recommendations were made to Extension employees on improving environmental issue communications to farmers.

REFERENCES: 16 cited

032. Buckhout, R. (1972). Toward a two-child norm-changing family planning attitudes. American Psychologist, 27(1), 16-26.

DESCRIPTORS: Higher education, descriptive research, ethnic background, preferences, attitudes, population education

VARIABLES: Attitudes toward family planning.

PURPOSE: The purpose of the study was to assess the cross-cultural attitudes toward family planning of young, unmarried students in the 18-30 age bracket.

SUBJECTS: Subjects were 267 unmarried undergraduate students at the California State College at Hayward. Subjects were stratified by race: 80.9% white, 9.1% black, 5.3% Spanish surname (Chicano), 3.0% Oriental, and 1.5% native American. There were approximately equal numbers of males and females and median income level of parents was $10,000-$12,000. 26.6% were Catholic, 34.6% Protestant, 3.0% Jewish, 5.2% other, and 28.8% no preference. Expanded sub-sample groups of Chicano and black students were also surveyed.

RESEARCH DESIGN: A questionnaire was prepared by peers of the sample, which collected demographic data, biographical data, personal desires about future family planning; attitudes toward sterilization, birth control, and abortion; and attitudes toward proposed population control policies. A 10-point Likert-type scale was used for attitudinal measures. Data were collected by 16 interviewers who recorded subjects' responses. Interviews of the black and Chicano sub-samples were conducted by interviewers of the same race.

RESULTS: It was found that ideal number of children desired was 2.6, with blacks and Chicanos desiring significantly more children ($p<.1$). Probability of using artificial birth control was relatively high. Blacks were significantly more likely to seek abortion ($p<.05$). Blacks and Chicanos were significantly less likely to seek sterilization than the main sample ($p<.05$). Women were more likely to prefer men sterilized than vice versa ($p<.05$). Adoption was significantly less desirable when fertile than when nonfertile. ($p<.05$). Blacks were less favorable toward mandatory sterilization than the main sample (p<.01).

REFERENCES: 25 cited

033. Buethe, C., & Smallwood, J. (1987). Teachers environmental literacy check and recheck, 1975 and 1985. The Journal of Environmental Education, 18(3), 39-42.

DESCRIPTORS: Ecology education, issue awareness/knowledge of issues, teacher education in-service, affective, descriptive research, trend analysis, formal, knowledge, energy education

VARIABLES: Energy/environmental terms and teachers' knowledge of and definition of said terms.

PURPOSE: To determine: 1) What important environmental vocabulary is known/unknown by teachers; 2) How well known are environmental concepts that directly relate to the vocabulary; and 3) What are the teachers' feelings about environmental issues.

SUBJECTS: 500 K-12 teachers from Indiana in 1975 and again in 1985 were randomly chosen.

RESEARCH DESIGN: Descriptive research. A questionnaire was designed using three parts: 1) forced choice test; 2) a multiple-choice test; and 3) a Likert-type scale.

RESULTS: A percentage analysis method was used to compare the 1975 and 1985 surveys. No validity or reliability measurements were made.

1. In twenty-two of twenty-five cases 1985 teachers appear to be more familiar with environmental vocabulary than the 1975 sample.
2. Fewer than 50% of the 85 respondents knew the meanings of widely used terms such as E.P.A., ozone, hydrocarbon, etc.
3. Terms such as dioxin, superfund, and catalytic converter were unknown to more than 2/3 or the teachers.
4. 50% indicated they did not know the meaning of biotechnology or breeder reactor.
5. Mean scores improved by more than 25% on items regarding understanding of energy resources, fireplace use, noise effects, food chains, and sources of electricity.
6. Overall Energy/Environmental literacy of Indiana teachers appears low, but some gains have been made.

REFERENCES: 11 cited

034. Bunting, T., & Cousins, L. (1983). Development and application of the "Children's Environmental Response Inventory". The Journal of Environmental Education, 15(1), 3-10.

DESCRIPTORS: Elementary, middle/junior high, affective, instrument development, descriptive research, rural, urban, attitudes, values

VARIABLES: Pastoralism, urbanism, environmental adaptation, stimulus seeking, environmental trust, need privacy, antiquarianism, and mechanical orientation.

PURPOSE: To report on the development and psychometric attributes of the Children's Environmental Response Inventory (CERI), a broad test of values, attitudes, and predispositions toward the external environment. Also, discussion of variations in grade, sex, and geographic residence of a large sample of 9-16 year-olds as measured by the developed instrument.

SUBJECTS: 522 students stratified by grade (4,6,8 & 10), for final test revision. 1109 students were tested in a subsequent administration of the instrument and were stratified by grade (as above), sex, and place of residence (rural/small town or urban).

RESEARCH DESIGN: The CERI is a downward revision of the existing Environmental Response Inventory (ERI) developed by McKechnie (intended for subjects 16 years of age and older). The test is intended for use in the 9 years and upwards range. The CERI consisted of 185 self-report, Likert-type questions. Item pool creation, professional evaluation of items, and a pilot investigation all contributed to the final version of the CERE.

RESULTS: The CERI shows significant correlation to the ERI and may be seen as sharing some of the established validity of the older scale. Internal consistency and reliability range from .78 to .91 (Cronbach's alpha), and .87 to .94 (Split-half test-retest, Spearman-Brown, [median]) respectively. The quality of the test statistics which have been produced indicate that not only do the constructs of environmental psychology exist in children as they do in adults, but that those constructs can be reliably assessed. Individual findings on the eight variables cited are supportive on initial hypotheses concerning each area. Definitions of variables and associated findings are too lengthy to list here. Further data collection is underway to standardize test scores, and validational research is needed to supplement existing test response data. Once firmly established, the CERI could be utilized in assessing EE program outcomes, and my be useful in vocational counseling. Theoretical mining of the constructs themselves holds great potential for further research.

REFERENCES: 11 cited

035. Burrus-Bammel, L., & Bammel, G. (1986). Gender test differences during an environmental camp. The Journal of Environmental Education, 17(3), 8-11.

DESCRIPTORS: Environmental/nature centers, program development, experimental research, non-formal, outdoor education, rural, attitudes, resource management education

INDEPENDENT VARIABLE: Gender.

DEPENDENT VARIABLE: Attitudes, knowledge, expectations.

PURPOSE: To determine the effects of gender on test scores and use the information to facilitate natural based resource group development in a non-biased manner.

SUBJECTS: Rural youth between the ages of 16 and 20 from the West Virginia area 1976, 1979, 1980 = 117 camp participants, 71 males, and 46 females.

RESEARCH DESIGN: The research was quasi experimental: pre and post tests were used. Subjects received a one week environmental education program. The attitude instrument used was sixteen Likert-type questions with five ranges from strongly agree to strongly disagree. The validity coefficient had been established at .92 using a panel of three experts.

RESULTS: The level of significance was set at .05. Both gender groups made significant gains between the pre and post attitude and knowledge tests. Upon combining the three years, there were only two significant between gender differences; the females were lower on the knowledge pre-test and the females made significantly greater gains between the two knowledge tests. Researchers concluded that an effective natural resource-based program should consider: 1) adding females, 2) accepting a greater number of females, and 3) developing special programs for low scoring females.

REFERENCES: 19 cited

036. Burrus-Bammel, L., Bammel, G., & Kopitsky, K. (1988). Content analysis: A technique for measuring attitudes expressed in environmental education literature. The Journal of Environmental Education, 19(4), 32-37.

DESCRIPTORS: Hypothesis generation, unobtrusive research, non-formal, attitudes, resource management education.

VARIABLES: Attitudes expressed in printed public relations documents, images created by expressed attitudes, consistency of the attitudes and images with the producer's philosophy.

PURPOSE: To determine whether content analysis is a reliable technique for measuring attitudes expressed in environmental education literature.

SUBJECTS: 115 Forest Service administration units located on the United States mainland. Each unit returned to the researchers a brochure for analysis. 91 of these brochures were determined to be usable for this content analysis.

RESEARCH DESIGN: Unobtrusive content analysis using 47 categories for the analyzing of brochure photographs. Gunning's Fog Index was used to determine each of the brochure's reading level.

RESULTS: No reliability data was given. The main findings were:

1. Forest Service brochures might picture more women, minorities, and elderly people.
2. Forest Service brochures might identify more people actively pursuing

appropriate forest recreation pursuits.
3. Forest Service brochures might depict a larger number of undomesticated animals.
4. Forest Service brochures might benefit from a lower reading level.
5. Forest Service brochures might use a greater variety of graphic techniques on the title panel.

REFERENCES: 19 cited

037. Buttel, F. H., Gillespie, G. W. Jr., Larson, O. W. III, & Harris, C. K. (1981). The social bases of agrarian environmentalism: A comparative analysis of New York and Michigan farm operators. Rural Sociology, 46(3), 391-410.

DESCRIPTORS: Instrument development, descriptive research, attitudes, educational background.

DEPENDENT VARIABLES: Attitudes toward regulation of industrial pollution; attitudes regarding agricultural chemicals; attitudes toward problem of soil erosion.

INDEPENDENT VARIABLES: Age, education, total family income, political ideology, indebtedness, gross farm income, net farm income, net worth, total acres farmed, total acres owned, number of hired workers, non-economic orientation toward farming.

PURPOSE: To determine factors that influence variations toward different environmentally-responsible behaviors among farmers in two different states.

SUBJECTS: Farm operators randomly selected from lists provided by the Crop Reporting Services of NY and MI. The response rate for NY farmers was 67.6% (n = 561); response rate for MI farmers was 64.0% (n = 308).

RESEARCH DESIGN: Original data were collected using questionnaires mailed to participants. Instruments included Likert-type items, direct questions, and categorical items.

RESULTS: Regression analysis, zero-order correlation coefficients, and conventional least square regression were used. An alpha level of 0.005 was selected. The researchers concluded that level of education bears little or no relation to the environmental attitudes of farmers. However, they observed correlations between farm size and environmental attitudes and between the degree of political liberalism and attitudes. Younger farmers, who struggle with economic security and must sacrifice long-term conservation practices for the sake of short-term profitability, find it difficult to implement soil conservation and safe farming practices. Further research was recommended.

REFERENCES: 42 cited

038. Bybee, R. (1987) Teaching about Science-Technology-Society (STS): Views of science educators in the United States. School Science and Mathematics, 87(4), 274-285.

DESCRIPTORS: Teacher education in-service, descriptive research, formal, perceptions/beliefs, knowledge, conservation education, science education, STS education, population education, global education

VARIABLES: Importance of STS problems, knowledge of STS problems, role and presentation of STS problems in the school curriculum.

PURPOSE: To survey science educators to determine: 1) Which STS problems are important?; 2) How will these STS problems change by the year 2000?; 3) How much do science educators know about STS problems?; 4) How important is it to study STS problems in school?; 5) Who should take courses in which STS problems are presented?; 6) How should STS courses be presented?; 7) How much emphasis should be placed on STS problems?; 8) Where is the U.S. in the development and implementation of the STS theme in school programs?

SUBJECTS: One hundred science educators chosen from a list of four National Science Teaching Associations, the majority of whom were male and employed by colleges and universities.

RESEARCH DESIGN: An existing survey was modified for this study and sent to the 100 subjects mentioned above. Seventy-seven percent of the surveys were returned. Survey respondents were presented twelve common issues related to science-technology-society and asked to rank them as to which were the most globally significant. In addition, the survey included questions on each of the 8 areas mentioned in the purpose section.

RESULTS: The respondents ranked population growth, water resources, world hunger, air quality, and war technology as the problems of highest importance. In general, the science educators surveyed indicated that STS problems will be worse by the year 2000. In general, science educators believed that very little or nothing is being taught at the pre-school, elementary, and middle school levels. STS themes are believed to be more prominent in high school programs. More than 50% indicated that colleges and universities are teaching some STS topics. There was agreement among respondents about the importance of inclusion of STS topics in the school program.

REFERENCES: 1 cited; other citations were not referenced by mistake

039. Calhoun, L., Shrigley, R.L., & Showers, D.E. (1988). Designing the nuclear energy attitude scale. Science Education, 72(2), 157-174.

DESCRIPTORS: Issue awareness/knowledge of issues, secondary, higher education, affective, instrument development, descriptive research, attitudes, energy education

VARIABLES: Students' attitudes toward nuclear energy.

PURPOSE: To design a valid and reliable Likert-type scale to assess attitudes toward nuclear energy for generation of electricity.

SUBJECTS: A pilot test of 100 trial Likert-type statements was administered to forty-one high school juniors and seniors representing rural and suburban schools in Pennsylvania. A pool of 36 items was readministered to 873 subjects representing high school students living within 20 miles of a nuclear plant (n=552), high school students living 100 miles or farther from a plant (n=166), college nuclear engineering students (n=44), college pre-service teachers (n=86), and adults from citizens action groups (n=25).

RESEARCH DESIGN: From the pool of 36 items tested, 20 of the more valid items were selected using 8 tests generated from the work of Abdel-Gaid et al. (1986). These tests were item-total correlation, evaluative quality, strata representation, negative-positive balance, inter-item correlation, coefficient alpha factor analysis, and known group technique. These 20 items constituted a long-form instrument from which six items were chosen, using pre-stated criteria, to constitute a short-form for use when time is a constraint. The long form was pilot tested using survey research methods.

RESULTS: Positive correlations (r-values) between individual items and the subjects' total score for the test items ranged from 0.46 to 0.86. In evaluation quality, mean scores ranged from 2.37 to 3.87. Standard deviations ranged from 0.93 to 1.23. Sub-components of the attitude survey were represented by from two to five items. In positive-negative balance, the scale had 9 negative and 11 positive statements. Inter-item correlations had r-values of 0.15 to 0.73. Coefficient alpha for internal consistency was 0.93, well above the recommended minimum of 0.80. A valid and reliable Likert-type scale was developed to test attitudes of adults, particularly senior high school and college students in Pennsylvania, toward the generation of electricity from nuclear energy.

REFERENCES: 31 cited

040. Cantor, J., Wilson, B. J., & Hoffner, C. (1986) Emotional responses to a televised nuclear holocaust film. Communication Research, 13(2), 257-277.

DESCRIPTORS: Issue awareness/knowledge of issues, affective, descriptive research, attitudes, values, issue-based, energy education, values/moral education

INDEPENDENT VARIABLE: Age of children (between 3-18 years).

DEPENDENT VARIABLE: Emotional response to viewing the television broadcast of The Day After.

PURPOSE: Based on previous developmental research concerning children, it was hypothesized that the degree of upset produced by viewing The Day After would increase with the age of the children.

SUBJECTS: The target population consisted of parents or guardians of children between the ages of 3 and 18. Telephone numbers were randomly selected from a Madison, Wisconsin, telephone directory. 161 households yielded completed interviews with the parents of the children who had viewed The Day After.

RESEARCH DESIGN: Descriptive methods were used. Fourteen trained interviewers administered the questionnaire by phone, surveying parents or guardians of children within a specific target audience.

RESULTS: A series of questions assessed the emotional reactions and behavior of the children who saw the movie. There were no significant effects associated with the sex of the child on any of the measures. The percentage of children who reportedly were more upset by The Day After than any other TV program increased significantly with age. The level of upset in the youngest group differed from that in the oldest group. In addition, the partial correlation between age (in years) and degree of upset, controlling for how much of the movie was seen, was significant.

REFERENCES: 37 cited

041. Caron, J. (1989). Environmental perspectives of blacks: Acceptance of the "New Environmental Paradigm". The Journal of Environmental Education, 20(3), 21-26.

DESCRIPTORS: Issue awareness/knowledge of issues, descriptive research, ethnic background, perceptions/beliefs, attitudes

VARIABLES: Age, education, income, attitudes, non-formal, ethnic groups.

PURPOSE: To investigate the environmental perspectives of urban blacks.

SUBJECTS: The sample consisted of 603 black respondents selected from a general population of black residents of five cities in a metropolitan area of southeastern Virginia. A stratified multi-stage cluster sample that focused on census tracts with 75% or more blacks was used. The clusters were sampled at 3 levels: cities, census tracts, and blocks. Initially, eligible census tracts were stratified by income and randomly selected. Subsequently, blocks were selected, and finally 3 households were interviewed from each selected block.

RESEARCH DESIGN: Descriptive research utilizing the new environmental paradigm (NEP) scale developed by Dunlop and Liere (1978) and a stratified, multistage cluster sample that focused on census tracts with 75% or more blacks.

RESULTS: The percentage of respondents from two samples who agree with items of NEP ($p=.85$), these findings support the contention that blacks are not anti-environmental but in fact show a pre-environmental sentiment. In black respondents, age showed a negative correlation but Kendall's tau of -.03 was negligible and nonsignificant. Measures of income showed a positive nonsignificant correlation with NEP scores (Kendall's tau - .03 and .05). Regarding education, the degree held was nonsignificant but the years of schooling was significant, Kendall's tau = .10 ($p < .05$). If environmentalists should seek support from the black community they should emphasize the interrelatedness of environmental and other issues, for example health issues. There were no recommendations for further research.

REFERENCES: 26 cited

042. Carpenter, E., Taylor, J., Cortner, H., Gardner, P., Zwolinski, M., & Danial, T. (1986). Targeting audiences and content for forest fire information programs. The Journal of Environmental Education, 17(3), 33-41.

DESCRIPTORS: Community resources, cognitive, descriptive research, social background, educational background, beliefs, attitudes, resource management education

VARIABLES: Beliefs about the effects of fires, socio-demographic characteristics, fire management practices.

PURPOSES: To determine how socio-demographic characteristics and beliefs about the effects of fire in forest environments predict public approval. Further, to determine recommendations for the design of fire information programs.

SUBJECTS: A telephone survey of 1200 residents in the Tucson metropolitan area completed one survey. A questionnaire completed by 1646 forest users belonging to organized recreational groups and resource management professionals comprised the second survey group. A sample of 193 participants drawn from the Tucson area from church and civic clubs, and parent organizations comprised the third survey group.

RESEARCH DESIGN: Descriptive research was utilized in the form of three surveys which were conducted independently, each using three different research methodologies. Portions of the studies were deliberately designed to overlap for comparison of results. Four questions about public support for alternative fire management practices were used as dependent variables and 10 questions relating to fire practices, and effects of those practices were independent variables. Log linear analysis was used to analyze the data. No mention of validity or reliability measurement was made.

RESULTS: There is a high level of support for manager-initiated fire management practices. The public can differentiate between situations resulting in beneficial effects versus those that result in harmful effects. The content of fire information programs needs to be more sophisticated. Public acceptance of allowing fires to burn increased with more information about fire and its control. The content of fire information programs needs to be directed towards a broad cross section of adults.

REFERENCES: 10 cited

043. Chase, V. (1986). Research on hands-on, field or museum science programs. CURRENT/The Journal of Marine Education, 7(4), 19-21.

DESCRIPTORS: Museums, synthesis of research, non-formal, field trip, marine education.

INDEPENDENT VARIABLES: N/A.

DEPENDENT VARIABLE: N/A.

PURPOSE: To provide a concise overview of research in nonformal education for use by marine educators. Categories include Needs, Efficacy, Program Structure, and "Other" (What Research Says to the Science Teacher).

SUBJECTS: N/A.

RESEARCH DESIGN: Selection of items to review was based on the author's use of the research in proposal development.

RESULTS: N/A.

REFERENCES: 14 cited

044. Chenery, M., & Hammerman, [illegible]. (1984-1985). Current practice in the evaluation of resident outdoor education programs: Report of a national survey. The Journal of Environmental Education, 16(2), 35-42.

DESCRIPTORS: Environmental/nature centers, program evaluation, descriptive research, outdoor education

VARIABLES: Current evaluation practices and tools used by resident outdoor education (OE) programs.

PURPOSE: To identify current practices used by administrators to evaluate resident outdoor education programs.

SUBJECTS: Subjects consisted of 350 outdoor education staffs representing various schools, camps, and agencies across the United States that offered resident outdoor education programs.

RESEARCH DESIGN: A 10-item questionnaire was mailed to a total of 350 camps, schools, and agencies that were identified either through the American Camping Association or through a study by the Institute for ECO Education. No specific reference to the sampling technique was made. Questionnaire items included evaluation techniques used, frequency of evaluations, focus and purpose of evaluation, and staff competencies. The return rate was 41% (n = 144). In addition, 171 evaluation instruments used by the OE programs and suggestions for research were submitted by the respondents.

RESULTS: Responses to the questionnaire items were summarized and reported in percentages. Results indicated that 45 percent of the centers/programs surveyed used subjective methods, 12 percent objective, and 36 percent both. Additionally, most programs were evaluated for purposes of improvement and planning, and that evaluations frequently assess overall satisfaction with the program, operational aspects, and students' attitudes. A model of the evaluation development process was also presented and discussed.

REFERENCES: 1 cited

045. Coffin, R. J., & Lipsey, M. W. (1981). Moving back to the land: An ecologically responsible lifestyle change. Environment and Behavior, 13(1), 42-63.

DESCRIPTORS: Citizenship action, hypothesis generation, ex post facto research, educational background, economic background, environmental sensitivity, values, behaviors

VARIABLES: Age, marital status, number of children, economic background, educational background.

PURPOSE: (1) to develop more detailed information regarding the demographic make-up of one group of "back-to-the-landers"; (2) to outline some general features of the lifestyle they desired; (3) to gather information on selected psychological issues related to the change in lifestyle; and (4) to make a preliminary assessment of the ecological implications of this lifestyle.

SUBJECTS: The potential participants in this study consisted of people who had expressed an interest in moving back to the land through advertisements placed in selected environmental publications which run "personals" advertising. Questionnaires were sent to 510 people and 277 (54.3%) returned them. Eighty-one of those were from people who had already moved. The sample of back-to-the-landers was not distributed proportionate to population. The South, Central and Eastern states were underrepresented. No significant differences were found between the respondents who had and had not moved.

RESEARCH DESIGN: Two overlapping four-page questionnaires were used in this study. One was directed to those in the sample who had already moved back to the land, the other to those who had not yet done so. Both fixed-response and open-ended items were included.

RESULTS: In general, the sample consisted primarily of young people with about equal proportions married and single. Over one-third of the respondents had at least one child, and many owned their own homes. Most were either living in central cities or suburban areas, or had lived there before moving. Over three-fourths of the sample had completed at least one year of college. Despite the generally high level of education and occupation, 64.5% overall reported incomes below $10,000. Secondly, the "desired lifestyle" items were grouped into three categories. Over three-fourths of the respondents indicated that they generally found the Self-Sufficiency items desirable, and even more favored the Social Contact items. The group was almost evenly split, however, on the Common Amenities scale. The respondents most interested in self-sufficiency generally tended to have lower incomes, fewer children, and to feel less secure about their jobs. People giving high desirability ratings to the common amenities were nearly the opposites of those desiring self-sufficiency. They were older, had relatively larger incomes, and were more likely to have children and a secure job. There were relatively few demographic correlates for those desiring higher levels of social contact. This group had slightly more education. Third, of those who had moved, 88.0% rated the overall experience as satisfying. Eighty-four percent felt that their health had improved as a result of the move. Relationships between members of the family appeared most negatively affected but were nonetheless still strongly positive overall. Finally, in spite of the environmentally conscious tone of this group's desire for self-sufficiency, environmental motives appear to play a relatively small role in their decision to move "back-to-the-land".

REFERENCES: 24 cited

046. Cousineau, C. (1982). The outdoor education student in the Canadian University. Journal of Outdoor Education, 16(2), 6-12.

DESCRIPTORS: Higher education, teacher education pre-service, descriptive research, interdisciplinary, formal, outdoor education

VARIABLES: Independent variable - status as an outdoor education student within a department that offers outdoor education courses, dependent variables - possession and perception of self characteristics as a student.

PURPOSE: To describe the main characteristics of outdoor education students in Canadian universities.

SUBJECTS: The research included two separate surveys, one conducted in 1980 and the other in 1982. Subjects of the 1980 survey were a pool of 284 third and fourth year students of the Physical Education and Recreology departments of the University of Ottawa, and third and fourth year students of the School of Physical Health of the University of Toronto. Subjects of the 1981 survey were a pool of 225 third and fourth year students in the departments of Physical Education and Recreology at the University of Ottawa.

RESEARCH DESIGN: Data were collected utilizing questionnaires designed to identify the number and proportion of students who were: 1) motivated towards a career in outdoor education, and 2) academically interested in outdoor education. The surveys also examined student academic performance, student participation in outdoor recreation activities, and motivations for participating in outdoor recreation activities. Means and percentages were computed for the data.

RESULTS: A large proportion of students, in departments where outdoor education courses are offered, aspire to a career in outdoor education. Outdoor education students appear to be equal to their peers in academic achievement as measured by grade point average. Outdoor education students engage in more outdoor recreation activities than do other students in the same department. The reasons for engaging in outdoor recreation activities are the same for outdoor education students as for their peers.

REFERENCES: 10 cited

047. Crater, H. L. & Mears, D. E. (1981). Evaluating attitudes toward, and knowledge of, energy problems in the eighth grade. School Science and Mathematics, 81(2), 121-123.

DESCRIPTORS: Issue awareness/knowledge of issues, middle/junior high, program evaluation, experimental research, formal, knowledge, attitudes, energy education

DEPENDENT VARIABLE: Knowledge and attitudes toward energy problems.

INDEPENDENT VARIABLE: Energy unit implemented in an eighth grade earth science class.

PURPOSE: The purpose of this study was to investigate the effects of an energy unit on the knowledge and attitudes of eighth grade students relative to energy problems.

SUBJECTS: Eighty-eight (n=88) eighth grade pupils at Verona Junior High School, Verona, Mississippi composed the treatment group. A comparison control group of eighth graders (n=42) in a nearby school was selected on the basis of similar demographics obtained from a prior study.

RESEARCH DESIGN: The treatment group received an inter-disciplinary energy activity packet developed for the Department of Energy (DOE) by the National Science Teachers Association (NSTA). The unit, entitled "Transportation and the City", was implemented into an early science course at Verona during the spring of 1979. Example topic activities covered were: interviews with elderly persons on energy sources used 40-50 years ago; a mock trial on the topic of the automobile doing permanent injury to humanity; building solar collectors; drawing energy conservation posters; etc. The control group received only the regular earth science course. At the end of the unit both the control and treatment groups were assessed on their attitudes using a twenty-four (24) item Likert-type Opinionnaires on energy problems and a twenty (20) item multiple choice test on knowledge of energy problems. Both instruments were adapted from an instrument on energy problems for young adults, ages 26-30, developed by the National Assessment of Educational Progress (NAEP). No instrument validity or reliability were reported.

RESULTS: The treatment group (TG) achieved a higher average score on the knowledge of energy problems test than did the control group (CG) (TG mean = 46.3%, SD = 21.5%, and CG mean = 41.5%, SD = 15.8%, respectively). The treatment group's attitude toward energy problems was found to be at a higher percentage for each item on the instrument than was the control group. It was concluded that the Verona eighth grade students were more conservation minded and aware of limited energy sources.

REFERENCES: None cited

048. Crosby, L. A., & Taylor, J. R. (1982). Consumer satisfaction with Michigan's container deposit law - An ecological perspective. Journal of Marketing, 46 (Winter), 47-60.

DESCRIPTORS: Issue awareness/knowledge of issues, citizenship action, program evaluation, descriptive research, ex post facto research, perceptions/beliefs, attitudes

DEPENDENT VARIABLE: Satisfaction with the deposit law.

INDEPENDENT VARIABLES: Convenience of returning and obtaining deposits back, and perceived effect of the law on: litter, cost of products, availability of favorite brands, and availability of favorite types and sizes of containers.

PURPOSE: To determine consumers' attitudes toward the bottle deposit law as a result of actual recycling experiences.

SUBJECTS: 302 Michigan consumers, 18 years old and older, were randomly selected using a two-stage digit dialing method to provide a probability sample of all telephone numbers in the state. All subjects were interviewed six to eight months after the deposit system began, and about half of the subjects had been interviewed before the deposit law was passed as part of a separate tracking study.

RESEARCH DESIGN: An ex post facto design and survey methods were used. Data were collected by telephone using an 11-item questionnaire. Subjects answered questions based on four and five-point response scales. The authors did not report reliability or validity of the survey instrument.

RESULTS: Through the use of univariate, correlational and multivariate analysis, the researchers concluded that the Michigan consumers surveyed were, among other things, satisfied with the deposit law (64%), that they felt it reduced litter (54%), that it was fairly convenient to return bottles to the store (52%), and that most would vote to retain the deposit system in case of a referendum to repeal the law (75%). Limitations of the study were discussed as well as possible implications of extending the deposit law into other states.

REFERENCES: 36 cited

049. Culen, G., Hungerford, H., Tomera, A., Sivek, D., Harrington, M, & Squillo, M. (1986). A comparison of environmental perceptions and behaviors of five discrete populations. The Journal of Environmental Education, 17(3), 24-32.

DESCRIPTORS: Issue awareness/knowledge of issues, citizenship action, adult/continuing education, affective domain, synthesis of research, educational background, perceptions/beliefs, knowledge

VARIABLES: Levels of education, issue ranking, citizenship action, perceived skill in the use of action skills, group types.

PURPOSE: To synthesize five empirical studies in order to provide a better understanding of environmental perceptions as they relate to similarity and differences across divergent populations of human beings.

SUBJECTS: A total of 468 subjects from different populations participated in the five studies. No treatment groups nor control groups were utilized. The age of the subjects ranged from 23 to 66. About twice as many men participated as women.

RESEARCH DESIGN: A synthesis of research findings across five diverse groups.

RESULTS: The synthesis utilized both chi-square analyses and t-tests. The alpha level was set at 0.01. The main findings were:

1. Group members with similar environmentally-allied characteristics perceive most important issues with more consistency than group members with few environmentally-allied similarities.
2. Environmentally-knowledgeable groups will, by and large, choose fewer issues for issue ranking than less environmentally-knowledgeable groups.
3. Groups knowledgeable about the environment will tend to cluster on one particular issue as the most important one to a far greater extent than will less environmentally-knowledgeable groups.
4. Members of a group consisting of individuals that have important environmentally-related similarities will perceive the environmental issues of greatest interest to them with a higher degree of homogeneity than members of a group consisting of in dividuals that have few environmentally-related similarities.

REFERENCES: 24 cited

050. Cutter, S. C. (1981). Community concern for pollutions: Social and environmental influences. Environment and Behavior, 13(1), 105-124.

DESCRIPTORS: Environmental sensitivity, issue awareness/knowledge of issues, descriptive research, social background, ethnic background, economic background, environmental sensitivity, attitudes.

VARIABLES: The environmental pollution concern data were compiled from measures of air, surface water, noise, and solid waste pollution. Socioeconomic status, race and attitudinal measures were also compared.

PURPOSE: The aim of this article was to determine how community attitudes toward pollution vary: (1) among social groups and (2) with levels of pollution.

SUBJECTS: Census tracts in the community were selected which were most representative of the category into which the community was placed. Respondents were then randomly selected in each census tract using a reverse telephone directory. Interviews with any adult in each sample household were conducted in a two-month period. Of the 1241 persons contacted, 940 consented to be interviewed, resulting in a response rate of 76%.

RESEARCH DESIGN: Attitude scores were calculated using a centrality measure, an evaluation measure, and an affective measure. Attitude scores were determined for each individual and then a mean derived for each community. These scores were then compared with the social and environmental pollution data. The data were subjected to stepwise regression analysis in order to assess the relative importance of the social factors and the environment factors in attitude variation.

RESULTS: Community attitudes can be predicted on the basis of the housing quality found in the community. Communities with lower quality housing, high rates of mobility, population change, and high densities (primarily inner city areas) exhibit high levels of concern about pollution. These findings are irrespective of the race of the community residents and their economic status. The most important environmental predictor of community concern for pollution is the solid waste index. High levels of solid waste coincide with high levels of concern. In comparing the two, the social indicators have more importance in the prediction of community concern for pollution than the environmental quality indicators. These findings suggest a reassessment of the assumption that concern about pollution is a white middle-class suburban phenomenon.

REFERENCES: 25 cited

051. Dionisopoulos, G. (1986). Corporate advocacy advertising as political communication. In L. Kaid, D. Nimmo, and K. Sanders (Eds.), New Perspectives on Political Advertising (pp. 82-106). Carbondale, IL: Southern Illinois University Press.

DESCRIPTORS: Issue awareness, descriptive research.

INDEPENDENT VARIABLE: Newspaper advertisements placed by the nuclear power industry.

DEPENDENT VARIABLE: Issue awareness.

PURPOSE: To examine the use of newspaper advertisements by the nuclear power industry to exert definitional hegemony over the post-Three Mile Island situation.

SUBJECTS: Newspaper advertisements in the New York Times, Los Angeles Times, Washington Post, Washington Star, and Boston Globe.

RESEARCH DESIGN: Qualitative research investigating newspaper advertisements placed in the New York Times, Los Angeles Times, Washington Post, Washington Star, and Boston Globe by the nuclear power industry during the post-Three Mile Island incident,; starting in June of 1979 and continuing through March, 1980. The researcher often balances the rhetoric found in the ads with information gathered from outside the ads.

RESULTS: The researcher concludes that the nuclear power industry placed two types of ads: those which focused on an energy need argument and those which focused on safety. The researcher often found these two strategies were combined. The need argument concentrated on the benefits of nuclear power as a means of relieving projected energy needs. The safety argument concentrated on the success of the safety technology in place at the plant. The newspaper advertisements used rhetoric which implied that the industry was providing factual information that had otherwise been kept from the American public. The researcher concluded the ads were less than candid. The researcher also found much of the rhetoric dealt with the accident itself and redefined what had happened at the plant. The researcher found these ads denied the true danger posed by the accident. The researcher recommends further attention to the concept of definitional hegemony and its relationship to the development of political issues.

REFERENCES: 42 cited

052. Disinger, J. F., & Bousquet, W. S. (1982). Environmental education and the State Education Agencies. The Journal of Environmental Education, 13(3), 13-29.

DESCRIPTORS: Program evaluation, descriptive research, educational background

VARIABLES: The educational background and roles/responsibilities of Environmental Education coordinators within the State Education Agencies.

PURPOSE: To provide an overview of the status of EE positions within the State Education Agencies as seen through the eyes of agency personnel most directly associated with EE.

SUBJECTS: The subjects for this study were the state coordinators for EE in each of the 50 states. Forty-nine of the 50 coordinators responded.

RESEARCH DESIGN: Questionnaires were mailed in January 1981 to the individuals identified as the appropriate recipients from a file maintained by ERIC/SMEAC since 1971, with frequent updates. By mid-February, 42 responses had been received, and a second mailing in March brought the total responses to 49. Respondents were given an opportunity to update their information in June 1981.

RESULTS: The data were summarized with frequencies, percentages, cross-tabulation, and measures of central tendency. It was found that approximately 75% of the state coordinators are male, all have their bachelor's degree, and all but two possess master's degrees. Less than one-fifth had a doctorate. All but three of the coordinators hold at least one form of educational certification and all but one coordinator has had K-12 experience. Many of the coordinators had duties other than their responsibilities in Environmental Education. The mean amount of time the coordinators reported spending working with Environmental Education was 32.9%. This represented a large drop from the mean of 53.7% found in a 1974 survey. Thirty-five respondents (71.4%) reported that no other professional staff in the same office were assigned to responsibilities in Environmental Education, while 16.3% recorded the assignment of one such additional person. Six states reported more than one additional staff member. Results were discussed and recommendations for further research made. An appendix includes the names, addresses and phone numbers of the State Education Agency Coordinators for Environmental Education in each of the 50 states, as of June 1981.

REFERENCES: 16 cited

053. Driver, B., & Johnson, L. (1983-84). A pilot study of the perceived long-term benefits of youth conservation corps. The Journal of Environmental Education, 15(2), 3-11.

DESCRIPTORS: Environmental/nature centers, secondary, affective, descriptive research, non-formal, social background, ethnic background, perceptions/beliefs, attitudes, resource management education.

VARIABLES: The variables being measured were: Environmental awareness, change in selected attitudes and behaviors, type of enrollees (e.g., age, sex, race, etc.), and social benefits.

PURPOSE: The purpose of this pilot study was to determine if the enrollees believed that Youth Conservation Corps (YCC) participation improved some of their attitudes, skills, and behavior; and to identify possible social benefits gained by the (YCC) enrollees.

SUBJECTS: A total of 1,200 subjects (600 students and 600 parents) participated. The subjects were randomly selected from the list of enrollees in the (YCC) program from 1972 through 1975. The response rate was 52.5%. The enrollees' ages (male and females) ranged from 15 to 18 years.

RESEARCH DESIGN: A descriptive survey design was used. The survey employed two questionnaires: one for former enrollees and one for parents of former enrollees. One half of the enrollees were mailed enrollee questionnaires. The parents of the other 600 enrollees were mailed parent questionnaires. No parents received questionnaires if their son or daughter received one. Both questionnaires included 57 questions. Ratings were on a 7-point response format which ranged from "no influence" (coded 1) to "very great influence" (coded 7). The instrument was developed by the research team using the judgment of the program administrators. The validity and reliability of the instrument were not reported.

RESULTS: Cluster and factor analysis were used to reduce the 57 benefit questions into 16 empirically defined "benefit scales" composed of statistically and logically related questions. Multivariate analysis of variance (MANOVA), analysis of variance (ANOVA), content analysis, chi-square, and t-test were utilized in the data analysis. The alpha level was set at 0.05. The main finding of the pilot study indicated that more than 97 percent of the respondents liked the YCC program, and more than 90 percent reported positive opinion of it. The educational implication of the study indicated that programs dealing with basic principles of natural resource management can enhance the enrollees' environmental awareness of the need to develop and to conserve (or use wisely) natural resources. The researchers did not provide recommendations for further studies.

REFERENCES: 10 cited

054. Dunlap, R. E., & Gale, R. P. (1972). Politics and ecology: A political profile of student eco-activists. Youth and Society, 3(4), 379-397.

DESCRIPTORS: Citizenship action, higher education, hypothesis generation, descriptive research, perceptions/beliefs, attitudes, verbal commitment

VARIABLES: Political-environmental attitudes and beliefs.

PURPOSE: To examine the political characteristics of college student eco-activists.

SUBJECTS: Sample of convenience (n=51) students known to be active in one or more of eight environmental campaigns/organizations on the University of Oregon campus. A comparison random sample of 237 University of Oregon (UO) students registered for the spring 1970 term was used. Another comparison group of Oregon SDS activists previously studied was also used.

RESEARCH DESIGN: A survey was distributed to all subjects which assessed subjects' self-reported political outlook, perceptions of relationship between environmental problems and society, perceptions of appropriate tactics for resolution of environmental issues, and perceived relationship of environmental radicalism to political radicalism.

RESULTS: Data were analyzed descriptively. Data indicated that eco-activists were less likely to view themselves as "radical left" than the SDSers (18% compared to 91%). Seventy-three percent (73%) of the eco-activists viewed themselves as slightly, moderately, or very liberal. Fifty-seven percent (57%) of the eco-activists were Democrats while 18% were Republican, compared to 57% Democrats and 26% Republican for the UO sample. Ninety percent (90%) of the eco-activists had engaged in non-environmental political issues compared to 100% for the SDS subjects and 68% for the UO subjects. Fifty percent (50%) of the eco-activists perceived that preoccupation with economic growth was the main cause of environmental degradation while 26% believed preoccupation with comfort and convenience was the cause. Corresponding figures for the UO subjects were 43% and 33%. Sixty-one percent (61%) of the eco-activists believed environmental problems could be solved only if significant changes were made in the political-economic system and 26% believed environmental problems could be solved only if the present political-economic system were replaced by a radically different system. The corresponding figures for the UO subjects were 42% and 6%. Most UO subjects (53%) believed environmental problems could be solved in the existing system. Only 27% of the eco-activists agreed that the environmental movement should join forces with the "New Left" compared to 10% agreement by the UO sample. 100% of the eco-activists and 96% of the UO subjects were willing to take action on environmental issues. 55% of the eco-activists indicated a willingness to participate in illegal demonstrations compared to 33% for the UO subjects.

REFERENCES: 27 cited

055. Eiser, J. R., Spears, R., & Webley, P. (1988). Predicting attitudes to oil and to nuclear energy. Journal of Environmental Psychology, 8, 141-147.

DESCRIPTORS: Issue awareness/knowledge of issues, affective, descriptive research, rural, perceptions/beliefs, attitudes, issue-based, energy education

INDEPENDENT VARIABLES: Gender, employment status, presence of family nearby, age, years in area.

DEPENDENT VARIABLES: Attitudes about having an oil/nuclear energy development nearby or elsewhere in the country, perceived impacts of new oil wells or a new nuclear power station on the community.

PURPOSE: To relate small town residents' attitudes about an oil/nuclear energy development with their beliefs about the cost/benefits of such projects.

SUBJECTS: Using electoral registers, 1033 residents of Wareham, England, were selected at random. The response rate (n=480) was 52.6%, once the list was purged of outdated addresses. The mean age in the sample was 47.6 years. Females were considered underrepresented since 61.8% of respondents were male.

RESEARCH DESIGN: This was a descriptive survey. In section one of the mailed questionnaire, subjects rated how strongly they opposed or favored the construction of oil wells/nuclear power station in their community or elsewhere in England. A seven-point, Likert-type scale was provided. In the second section, the local impacts of new energy developments were assessed. Using a nine-point scale, subjects indicated whether they thought nine direct or eight indirect impacts would be better or worse for the community. Lastly, demographic information was collected. A follow-up reminder was sent to nonrespondents after three weeks. No instrument validity or reliability estimates were reported.

RESULTS: For both issues, the sample was divided into four attitude groups. Subjects were considered either neutral/pro, locally opposed, moderately opposed, or extremely opposed to nuclear power; and either very pro, moderately pro, locally neutral/anti, or neutral/anti to oil. Thus, a new nuclear power station was viewed more negatively than new inshore oil operations. A Chi-squared analysis revealed that the only significant ($p< 0.05$) demographic differences were between males and females with respect to nuclear energy. Attitudes to both energy developments were positively associated (Kendall's tau = 0.25, $p< 0.001$). A two step-wise discriminant functions analysis was run on the beliefs of the attitude groups. All F-values were significant ($p< 0.001$). Among the nuclear power station beliefs, three functions emerged which accounted for 47.7%, 29.7% and 22.5% of the variance. Likewise, three functions discriminated between oil well impact beliefs, accounting for 69.7%, 24.6% and 5.7% of the variance. Residents who were locally opposed to a nuclear power station were more likely to share their pessimism about landscape, wildlife and visual impacts rather than their transportation/storage and local health concerns with other opponents. Similarly, local opposition to oil drilling was most closely associated with concern for visual and marine impacts. The researchers stressed the importance of distinguishing between opposition to the type and opposition to the location of a new energy development. No single set of evaluation criteria arose. In general, pro-development residents stressed the economic benefits to be had, locally-opposed residents wanted to preserve a specific environment, and opposed residents believed the risk of a major accident was the most important consideration.

REFERENCES: 8 cited

056. Ewing, M.S., Campbell, N.J., & Brown, M.J. (1987). Improving student attitudes toward biology by encouraging scientific literacy. The American Biology Teacher, 49(6), 348-350.

DESCRIPTORS: Higher education, program evaluation, experimental research, directed instruction, knowledge, attitudes, science education

INDEPENDENT VARIABLES: Intensive reading skills, participation, group discussion.

DEPENDENT VARIABLES: Student attitudes toward biology

PURPOSE: To determine if introductory biology students who participate in a class emphasizing intensive reading skills and small group discussion report more positive attitudes toward the course than do students in a traditionally taught class.

SUBJECTS: Two treatment groups totaling 126 undergraduate college students enrolled in an introductory biology class for non-majors were sampled

RESEARCH DESIGN: A quasi-experimental, pretest-posttest control group design was used. Subjects in control group were taught in traditional format of three lectures and one lab weekly. Experimental group attended two lectures and participated in one small group discussion each week in addition to lab. Two instruments were developed to assess attitude and reading comprehension. Attitude instrument contained 10 Likert-type items. Reading instrument contained 14 biologically focused text passages followed by three four-option multiple choice items. The reading instrument was administered during second class meeting and again in the 15th week of semester. The attitude instrument was administered in the 15th week of the semester. Chi-square analysis of demographic data revealed no important differences between control and experimental groups. Internal reliability calculated from pilot study using Cronbach's alpha formula a=0.71; Kuder-Richardson formula 21 used to determine internal reliability on pretest and posttest were 0.78 and 0.87, respectively.

RESULTS: Multivariate analysis of covariance (MANCOVA), and Pearson correlation coefficients were used. Difference of student attitude in two groups using pre- and post- test scores (using MANCOVA) was significant ($p < .05$); attitude towards course (using Pearson) was $p < .01$. Students whose class experience included a discussion group reported significantly more positive attitudes toward the course than students in the control group (t = 2.39, df = 68, p < .02). Attitude toward the course was found to be a significant (p < .01) covariate, but no significant differences in attitudes toward the course were controlled in analysis.

No consistent pattern of relationship between reading subtest scores and attitude toward course was identified in either group. Student attitude was found to be significantly correlated with posttest total reading score for both the control (r = 0.41, df = 68, p< .01) and the experimental (r = 0.50, df = 54, p< .01) groups.

Self-perceived benefits of participating in the experimental group were identified. Positive correlation existed between students' attitudes toward the course and: (a) the perceptions that the experimental group did not take the time needed to study other course content (r = 0.23, df = 54, p< .01), (b) increased confidence in understanding biology (r = 0.45, df = 54, p<.01), and (c)increased reading comprehension of biological material (r = 0.46, df = 54, p< .01). Therefore, the findings show that participation in a class which emphasizes intensive reading skills and small group discussion will enhance students' integration and understanding of biological knowledge.

REFERENCES: 15 cited

057. Fischer, E. H. (1972). Birth planning of youth: Concern about overpopulation and intention to limit family size. American Psychologist, 27(10), 951-958.

DESCRIPTORS: Issue awareness/knowledge of issues, citizenship action, higher education, descriptive research, personality type, perceptions/beliefs, attitudes, locus of control/efficacy, verbal commitment/intention, population education

VARIABLES: Beliefs about overpopulation, intention to control one's own reproduction rate.

PURPOSE: The purpose of the study was to assess the relationship between beliefs about overpopulation and intention to control one's own reproduction.

SUBJECTS: Subjects were a sample of convenience (n=699) of beginning nurse trainees at an urban hospital, part-time and regular students at several Connecticut colleges, and University of Hawaii upperclassmen. Most subjects were between 18 and 22 years of age, single, and Catholic or Protestant.

RESEARCH DESIGN: All subjects were administered an attitude inventory measuring: (1) number of children wanted, (2) reason(s) for chosen family size, (3) certainty about desired family size, and (4) attitude toward adoption. One group of nurse trainees took the Rotter Internal-External Locus of Control Scale, Rosenberg's Self-Esteem Inventory, and Marlowe and Croune's Social Desirability test. Other groups completed the Interpersonal Trust Scale and an abbreviated version of the California F Scale

(Authoritarianism). Scales were administered in psychology classes for the college students and in specially arranged sessions for the nurses.

RESULTS: A correlation coefficient of .70 was found between all variables regarding concern about overpopulation and intention to limit personal reproduction. However, the correlation between concern and family size preference was relatively low (r=.39). There was a significant correlation between marital status and certainty of family size preference (p<.001). Humanitarian scores were significantly related to all birth planning variables, p<.01. Authoritarianism correlated significantly and negatively to unconventional views of parenthood and birth control variables (p<.01).

REFERENCES: 27 cited

058. Ford & Cloninger. (1982-83). Multi-phasic mood changes in a five-day residential outdoor education experience. The Journal of Environmental Education, **14**(2), 29-31.

DESCRIPTORS: Environmental sensitivity, outdoor classrooms, elementary, descriptive research, behaviors, outdoor education.

VARIABLES: Mood factors (11), five experiential phases of anticipation, arrival, on-site departure, recollection.

PURPOSE: To shed more light of the effect of five phases of experience ie anticipation arrival, on-site departure, recollection, on-mood scores.

SUBJECTS: 310 sixth graders from St. Helen's Oregon Public schools. Twenty-seven units of 7-10 students were randomly assigned to five test groups.

RESEARCH DESIGN: Descriptive survey methods were used. A check list with 33 adjectives to measure 11 mood factors on a 4 point Likert-type scale (MACL) was self-administered by subjects during a five day outdoor education program at a Boy Scout camp in Oregon. One way analysis of variance was used to analyze the data. Tukey procedure was used to isolate the sources of significant differences between mood score.

RESULTS: The level of significance was set at .05. Data indicated that students were significantly more elated at arrival and departure times than during other 3 phases, and least elated during the middle of the program. Aggression was felt more during on-site and departure phases as opposed to anticipation, arrival or recollection. Significant difference in moods of sadness and egotism increased in the mood from anticipation phases to a peak departure phase. Two weeks after program sadness mood reversed to less sad and egotism remained higher than during the anticipation stage. Researchers concluded that outdoor school directors' hope to change social affection concentration and surgency to a more positive stance were not realized. Student moods make them less receptive than they might be at other times.

REFERENCES: none cited

059. Fortmann, L. (1988). Predicting natural resource micro-protest. Rural Sociology, 53(3), 357-367.

DESCRIPTORS: Citizenship action, ex post facto research, social background, economic background, rural, urban, values, personal responsibility, resource management education

INDEPENDENT VARIABLES: Urbanization, affluence, percent population change, environmental group in county.

DEPENDENT VARIABLES: Micro-protest against timber harvesting, as measured by letters of protest and protested plans

PURPOSE: To explain variations in rates of micro-protest against timber harvesting on private lands in 34 California counties.

SUBJECTS: 34 counties that constitute the universe of California counties in which timber is harvested.

RESEARCH DESIGN: An ex post facto design was used. Protest was measured at the county level by counting the number of letters accepted which argued against the approval of each timber-harvesting plan filed between 1977 and 1985. The rate of protest was derived by expressing the number of protested plans as a percentage of all plans filed.

RESULTS: Affluence and urbanization had the greatest bivariate and multivariate effects on rates of protest in the counties researched. Rate of protest was higher in more affluent and more urbanized counties.

REFERENCES: 48 cited

060. Fortner, R. W. (1983). Knowledge, attitudes, experiences: The aquatic connection. CURRENT/The Journal of Marine Education, 5(1): 7-11.

DESCRIPTORS: Issue awareness/knowledge of issues, elementary, middle/junior high, descriptive research, environmental sensitivity, knowledge, attitudes, marine education

INDEPENDENT VARIABLES: Students' experiences and information sources.

DEPENDENT VARIABLES: Marine and aquatic knowledge and attitudes.

PURPOSE: To determine marine and aquatic knowledge and attitudes and identify relationships of these factors to students' experiences and information sources.

SUBJECTS: Fifth and ninth grade Ohio students and tenth graders in Virginia were chosen as intact classes randomly selected by the principals of randomly chosen schools. Stratification assured that the number of schools selected in coastal and inland areas of each state was proportional to the school populations in those regions. Sample size represented 1.5% of Ohio student population in the target grades and 1% of Virginia tenth graders.

RESEARCH DESIGN: The surveys were developed specifically for the studies using previously validated items and newly tested items to fill gaps in an existing conceptual scheme for marine education. Reviews by content experts, along with extensive pilot testing, were conducted for validity assessment. Reliability measures were not reported. In both states, the knowledge survey consisted of multiple choice and true/false items. The Virginia attitude survey consisted of Likert scale responses to a series of statements about marine issues. In Ohio, a semantic differential was used with referents of The Ocean and Lake Erie. An experience profile made up the third section of the survey.

RESULTS: Knowledge scores ranged from 37.6% correct in Grade 5 to 49.6% in Grade 10. Ninth and tenth graders answered science and social studies items with equal accuracy (48.3-50.6%), but humanities questions were answered correctly less often. In all grades, those with high knowledge scores had significantly more positive attitudes about the subject of the survey. White males in coastal areas scored highest in all grades.

Two specific experiences each accounted for a significant amount of variance in knowledge sores in grades 9 and 10: watching Cousteau television programs and being able to swim. The majority of all students in all grades perceived that their marine knowledge came mostly from television. For fifth graders, the second information sources were Classes in School, but for ninth and tenth graders the second source was Coastal Activities.

The author recommended steps to increase knowledge levels and to equalize access to coastal activities and information for inland schools, females and nonwhites. She identified efforts in progress in these areas.

REFERENCES: 12 cited

061. Fortner, R. & Lyon, A. (1985). Effects of a Cousteau television special on viewer knowledge and attitudes. The Journal of Environmental Education, 16(3), 12-20.

DESCRIPTORS: Issue awareness/knowledge of issues, adult/continuing education, program evaluation, experimental research, non-formal, social background, knowledge, attitudes

INDEPENDENT VARIABLES: Viewing of Cousteau documentary.

DEPENDENT VARIABLES: Viewer knowledge and attitudes about documentary content.

PURPOSE: To determine the influence of a Cousteau documentary on viewer knowledge and attitudes and to assess changes in those over time.

SUBJECTS: A potential sample of 1000 viewers was systematically selected by computer from a population of 30,000 cable TV viewers in the Columbus, Ohio area. From these, each of two sets of callers selected 250 volunteers each to be in treatment and control groups. Of these forty-four viewers in the treatment group and seventy-five viewers in the control group completed the study. Nearly equal numbers of men and women of middle class socio-economic background completed the study.

RESEARCH DESIGN: A true experimental design was used. Participants in the treatment group were asked to take a pretest, watch a Cousteau documentary, take an immediate posttest and then a retention test two weeks later. The control group was asked to take the posttest and retention test as part of a research project about the sea. All tests were administered interactively. Reliability and internal validity are discussed.

RESULTS: T-tests and Chi-square comparisons were used. Demographic differences between treatment and control groups were not statistically significant at the .05 level. Pretests indicated that most respondents were cognizant of basic facts and current issues about marine mammals. Statistically significant gains in knowledge were noted on posttest of the treatment group. Losses on retention tests were statistically significant ($p < 0.05$). Retention test scores were still significantly higher than pretest scores ($p < 0.001$). Control group first test scores were not significantly different from treatment group pretest scores. The control group did show significant gains ($p < 0.05$) on the second test. Attitudes of the treatment group appeared to have been affected by the viewing of the program, with 75% of the items registering a shift toward or beyond the attitudinal goals established by the program producers. Such shifts appear to be temporary for most items, though only one item returned to its pretest level. Perhaps small incremental changes may eventually be recognizable as new beliefs. Use of interactive television offers the potential for documenting the results for existing programs.

REFERENCES: 25 cited

062. Fortner, R., & Mayer, V. (1989). Marine and aquatic education - A challenge for science educators. Science Education, 73 (2), 135-154.

DESCRIPTORS: Higher education, program evaluation, historical research, descriptive research, multi-disciplinary, formal, non-formal, science education, marine education

DEPENDENT VARIABLES: Amount of funding for education and types of Sea Grant education programs.

INDEPENDENT VARIABLE: Sea Grant Directors' rank order of types of educational programs.

PURPOSE: To assess funding patterns, and changes in funding patterns, for specific types of Sea Grant education programs from 1976-1987 and to characterize the current status of education programs offered by Sea Grant.

SUBJECTS: Directors of each Sea Grant program in the United States and

Puerto Rico (n=30). Twenty-nine (29) of the thirty provided responses.

RESEARCH DESIGN: A descriptive-survey research design was used. Questionnaires were sent to Sea Grant directors asking them questions concerning the education component of their programs. In order to provide a historical perspective for the study, annual reports of funding for Sea Grant programs from 1976-1987 were examined and categorized by year as to numbers of projects and funding dollars.

RESULTS: Twenty-four respondents indicated that they had an "identifiable education component" within their program. When asked to identify the "most significant education project funded by your program," eleven directors identified K-12 curriculum development projects. When directors were asked to rank types of education programs in order of importance, according to mean rank, nonformal education was ranked highest with a mean rank of 3.9 and teacher education ranked lowest with a mean rank of 1.9. Based on the research, the authors recommeded that science educators, in states having sea grant programs, assist in developing marine and aquatic education programs where needed and use their research and knowledge skills to further research in this area.

REFERENCES: 24 cited

063. Foxx, R. M. & Schaeffer, H. (1981). A company-based lottery to reduce the personal driving of employees. Journal of Applied Behavioral Analysis, 14(3), 273-285.

DESCRIPTORS: Program evaluation, experimental research, educational background, urban, behaviors, conservation education.

INDEPENDENT VARIABLE: Lottery in which rewards were given for decreasing miles driven.

DEPENDENT VARIABLE: Percent of average miles driven per day relative to an initial baseline average.

PURPOSE: To determine the effectiveness of a driving reduction program that is both cost-effective and simple to implement.

SUBJECTS: Employees of a research and development consulting firm in a Washington, D.C. suburb who volunteered and were consequently chosen for this study on driving habits. Seven (7) subjects were placed in a control group and eight (8) were placed in an experimental group. Selection for groups was based on responses to a questionnaire administered to all volunteers.

RESEARCH DESIGN: This study involved two conditions: (a) a baseline (1 month) in which no consequences were attached to driving behavior; and (b) a month-long lottery in which participants in the experimental group were rewarded for decreasing their percentage of average miles driven per day relative to their initial baseline average. The experimental group received an ABA order of conditions while the control group remained in baseline. The lottery condition consisted of four weekly lotteries and one general drawing held at the end of the month. To be eligible for the drawing, a specified reduction in mileage had to be achieved. The reliability of the response measure, the odometer reading, was believed to be quite high for reasons specified in the report. Odometer readings were done by two independent readers. Agreement between the recorders averaged 98.8%. A cost-benefit analysis was done on the program to determine the program's cost effectiveness.

REFERENCES: 9 cited

064. Fritzsche, D. (1981). An analysis of energy consumption patterns by stage of family life cycle. Journal of Marketing Research, 18(May), 227-32.

DESCRIPTORS: Hypothesis generation, ex post facto research, behaviors, conservation education, energy education

INDEPENDENT VARIABLE: Stage of family life cycle.

DEPENDENT VARIABLE: Household energy consumption.

SUBJECTS: Data from a random sample (20%) of the 19,975 respondents to the 1972-73 Bureau of Labor Statistics (BLS) Consumer Expenditure Survey were used. The sample yielded 3897 cases representing a national sample of households.

RESEARCH DESIGN: Using BLS data households in the sample were classified as to stage of family life cycle (FLC) using two existing scales: Wells and Guber (1966) and Murphy and Staples (1979). Energy consumption data for the households were also selected.

RESULTS: Analysis of covariance including a multiple classification analysis was performed on total energy consumption and on each of the types of energy consumed by household. The factors for analysis were FLC and number of family members working. The covariate for the analysis was income. Results supported FLC as a predictor of energy consumption. Significant differences ($p<=.05$) in energy consumption by stage of family life cycle were found, total energy consumption tending to increase with succeeding stages of life cycle and then decrease throughout the remaining stages of the FLC. Implications for conservation opportunities and public policy are discussed.

REFERENCES: 9 cited

065. Geisler, C., & Martinson, O. (1982). Social structural influences on the adoption of selected land use innovations. The Journal of Environmental Education, 14(1), 27-33.

DESCRIPTORS: Issue awareness/knowledge of issues, affective, descriptive research, rural, urban, educational background, economic background, preferences, attitudes, issue-based

VARIABLES: Degree of support for land use policy innovations, place of residence, social class, educational level, environmental concern, age.

PURPOSE: To study the variability of support for land use policy innovations as a function of: (1) urban vs. less-populated places of residence, (2) educational level, (3) social class, and (4) environmental awareness.

SUBJECTS: 1,423 non-institutionalized individuals residing in northwestern Wisconsin, where agriculture, recreation, and retirement account for much of the region's livelihood.

RESEARCH DESIGN: In this descriptive study data were collected in 1974 from a multistage random sample who were administered a survey designed to measure both degree of support for four specific land use regulations and degree of environmental concern. Environmental concern was assessed by use of a scale measuring awareness of local environmental problems in six potential problem areas (Cronbach's Alpha = .81). References were cited containing further discussion of this scale. Demographic data were also collected on age, educational level, place of residence (rural, village, or urban), and social class as determined by reported income, occupation and real estate holdings.

RESULTS: Percent of respondents in favor or in opposition to the four land use controls were reported and indicated that urban respondents favored land use policies more than did respondents from other places of residence. No levels of significance were reported. Standardized regression coefficients were obtained by regressing each of the four land use regulation measures on real property value and social class while controlling for age, education, and place of residence. Beta coefficients and levels of significance are reported for each variable. Education and real property value were shown to have notable influence on land use policy acceptance while the effects of age, social class standing and place of residence were negligible. Land use regulation policies were then regressed on environmental problem awareness, age, education, family income, farm occupation, real property value, and place of residence. Regression coefficients and levels of significance were reported. Environmental awareness was shown to be the dominant predictor of land use policy acceptance. Relationships between the other variables and land use policy acceptance were discussed. Concern was expressed for divergence of attitudinal support for land use regulations and actual behavior due to the inconsistency between beliefs and behaviors across population groups reported in the literature.

REFERENCES: 50 cited

066. Geller, E. Scott. (1981). Evaluating energy conservation programs: Is verbal report enough? Journal of Consumer Research, 8(3), 331-335.

DESCRIPTORS: Citizenship action, program evaluation, experimental research, knowledge, attitudes, verbal commitment/intention, energy education

INDEPENDENT VARIABLE: Attendance at energy conservation workshop.

DEPENDENT VARIABLES: Attitudes, knowledge, intention as related to energy conservation practices

PURPOSE: To assess the attitudes, knowledge, and behavioral intentions of adult workshop attendees regarding energy conservation. A subsequent evaluation of actual behavioral effects was also made by visiting the homes of some workshop attendees.

SUBJECTS: The initial questionnaire was given to 117 voluntary attendees at a 3-hour energy conservation workshop. In the behavioral follow-up, 40 homeowners who had attended a workshop were the experimental group, while 40 residents from the immediate neighborhood who had not attended a workshop acted as the control group.

RESEARCH DESIGN: A pretest-posttest control group design was used. Attendees at an energy conservation workshop completed a biographical questionnaire to obtain basic demographic information, and they received a 4-page attitude/knowledge/ intention survey which used a 10-point Likert-type scale. Same survey was administered after the workshop. A random sample of workshop attendees and another resident in the area (control) were interviewed as to the extent of their energy conservation practices. Half of workshop and control groups also received a special intervention, in the form of informational pamphlets. A second visit was made to subjects who had not insulated their hot water heater before the first visit. The same information which had been gathered in first visit was collected again, noting any differences. Informational pamphlets were distributed to residents who had not received them previously. These residences received a third visit.

RESULTS: Questionnaire results indicate that the energy workshop raised individual concern for energy crisis and increased optimism that individuals can effect substantial reductions in energy consumption. Two-way analysis of variance was used to measure statistical differences ($p < .05$). During home-action surveys, the initial assessment indicated few behavioral effects of the conservation workshop. For example, more residents in the workshop group had installed water-flow restrictor (which had been distributed during workshop) than those residents in the control group. But only 11% of the homeowners attending the workshop had installed the flow restrictor. The researchers concluded that the questionnaire results support the use of community workshops to reduce energy consumption. Yet, it was noted that workshops, informational pamphlets, and media promotion should not be relied on to promote energy conservation unless they are supplemented with other techniques to motivate action.

REFERENCES: 23 cited

067. Geller, J., & Lasley, P. (1985). The New Environmental Paradigm Scale: A reexamination. _The Journal of Environmental Education_, _17_(1), 9-12.

DESCRIPTORS: Affective, instrument development, descriptive research, secondary analysis, perceptions/beliefs, attitudes

VARIABLES: The dimensionality of the New Environmental Paradigm Scale.

PURPOSE: The study examined the New Environmental Paradigm Scale to see if it possessed dimensionality across three populations.

SUBJECTS: The three populations utilized were from two separate surveys. One was conducted in 1979-1980 and consisted of one farm and one urban population in Iowa. The second survey was conducted in Missouri in 1980 by soliciting views from local farmers in a critical soil erosion area.

RESEARCH DESIGN: The data from the previous surveys were pooled together and analyzed by confirmatory factor analysis techniques. A chi-square statistic was used to test the goodness of fit of the model. The analysis included testing for the minimum number of factors needed to fit the data for the all three populations. The analysis used the confirmatory factor techniques to test the dimensionality of the scale.

RESULTS: The researchers were unable to find a good fit for any of the samples in the three factor model (33 df). Similar tests were performed on four- and five-factor models. A minimum number of four factors (24 df) was determined to be needed to fit the data for the Iowa and Missouri samples. Five factors (16 df) were needed for the Urban sample. A previous hypothesis by Dunlap and Van Liere concerning the dimensionality of the scale was thus rejected. However, an exploratory factor analysis was done to determine if the NEP possessed a stable factor structure across the three populations. A non-item, three-factor model was created for this purpose. The truncated scale reflected three dimensions as the analysis was unable to reject the model for all three samples. The study was unable to confirm the stability of the alternative version of the NEP, but the analysis did show some elements of stability in the scale. Further testing was recommended to clarify the scale's standing.

REFERENCES: 15 cited

068. Gifford, R., Hay, R., & Boros, K. (1982-1983). Individual differences in environmental attitudes. The Journal of Environmental Education, 14(2), 19-23.

DESCRIPTORS: Higher education, affective, descriptive research, educational background, personality type, knowledge, attitudes, verbal commitment/ intention

VARIABLES: EE curriculum, student's academic orientation, age, sex, and year in school.

PURPOSE: To gain some understanding of the influence controllable factors have vs. the influence less controllable factors have in the development of positive attitudes, commitment, and knowledge concerning the environment.

SUBJECTS: One hundred (100) university students selected "more or less" at random, and thirty-six (36) students from the same university and registered either in a one-term environmental issues course, or in the university's Environmental Studies Program.

RESEARCH DESIGN: A correlational analysis was employed on the five variables being observed. Initial measurement was achieved with the use of a 45 item inventory developed by Maloney, Ward, & Braucht (1975) to assess affect, verbal commitment, actual commitment, and knowledge of students with regard to environmental concerns. Three categories were used to differentiate students' academic orientation (major). Other demographic data were collected. No estimates of validity or reliability were given for the objective type questionnaire.

RESULTS: Means and standard deviations are reported for the various groupings as a point of reference for the correlational analysis. Varying levels of statistical significance were used to report the data ranging from p<.05 to p<.001. The authors further analyzed the four response groupings into sub-groupings developed by Smyth and Brook. They found that students from environmental program/courses scored higher in knowledge, verbal commitment and actual commitment than did the other students. Sex differences were seen, as females scored higher on verbal commitment and affect, while males scored higher in knowledge and show more emotion about the environment than do social studies and non-science students. The authors contend this initial study supports the notion that individual differences play a role in determining environmental attitudes independent of environmental education curriculum. They also urge further study to better analyze the interactions suggested by the data.

REFERENCES: 8 cited

069. Gill, J. D. & Crosby, L. A. (1986). Ecological concern, attitudes, and social norms in voting behavior. Public Opinion Quarterly, 50(4), 537-554.

DESCRIPTORS: Issue awareness/knowledge of issues, model building, secondary analysis, descriptive research, attitudes, verbal commitment/intention, behaviors

PURPOSE: To investigate the possible indirect relationships between ecological concern and environmental behavior. Hypotheses included: H1) relationships between cognitive structure, attitude toward the act, normative structure, subjective norm, behavioral intention, and behavior are as suggested by the Theory of Reasoned Action; H2A) ecological concern has an indirect, but no direct relationship with environmental behavior; and H2B) ecological concern has an indirect, but no direct relationship with behavioral intention.

SUBJECTS: A quota sample of households in California and Colorado obtained from a national consumer panel. Households were selected for inclusion by matching four household characteristics (population density, age of head, household income, and household size) with known census data for each state. A random selection procedure was used to select an eligible adult voter within each household. The response rate was 66.2% (n = 1,000; 500 from each state).

RESEARCH DESIGN: Data were collected using an instrument which, although conglomerate in nature, was patterned after VanLiere and Dunlap. All 10 items composing the Maloney et al. (1975) affect scale were included. Also included were the 5 attitude items from Kinnear and Taylor's Ecology Scale and 6 attitude items from Antil and Bennett's Socially Responsible Consumption Behavior Scale. The instrument employed a 7-point response scale from "strongly disagree" to "strongly agree." The 21 items were sorted a priori into 2 categories: those dealing with pollution and natural resource problems and those focusing on regulation and spending approaches to combating those problems. No validity estimates were reported. Separate scales formed by summing responses to the attitude items were found to have acceptable levels of reliability. Each subject received a pre-alert postcard 14 days before receiving the questionnaire. A standard inducement was offered to subjects. Follow-up telephone interviews were completed with 447 mail survey respondents and 100 non-respondents.

RESULTS: The analysis failed to falsify H1 (model validity) and H2A (sufficiency assumption-behavior), but did falsify H2B (sufficiency assumption-intention). Therefore, the researchers concluded: 1) "ecological concern serves a fundamental role as a background variable which indirectly affects behavior;" and 2) "the influence of ecological concern, measured as a generalized or global attitude, is mediated by more specific attitudinal, normative, and behavioral intention variables."

REFERENCES: 41 cited

070. Gilroy, J. M., & Shapiro, R. Y. (1986). The polls: Environmental protection. Public Opinion Quarterly, 50(2), 270-79.

DESCRIPTORS: Citizenship action, trend analysis, synthesis of research, perceptions/beliefs, attitudes, verbal commitment/intention

PURPOSE: To present a compilation of data from the files of the Policy Change and Public Opinion Change Project at NORC regarding survey questions from numerous polls that addressed the environment in some form.

RESEARCH DESIGN: Ten polling organizations that have conducted polls over the last 20 years that included questions concerning the environment were summarized(environmental questions only) in table form. The summarized questions are from polls that had questions on the following topics: 1) importance of environmental protection; 2) environment, energy, and the economy; and 3) paying costs of environmental protection.

RESULTS: Results are not given in the traditional sense. Rather an appendix-like summary of the results of the environmentally-oriented questions from ten polling organization's polls are presented.

REFERENCES: 18 cited

071. Girondi, A.(1983). A discriminant analysis of attitudes related to the nuclear power controversy. The Journal of Environmental Education, 14(4),2-6.

DESCRIPTORS: Instrument development, descriptive research, educational background, perceptions/beliefs, attitudes, issue-based, energy education

VARIABLES: Attitudes and opinions about: 1) faith in science and technology, 2) health and safety, 3) need for nuclear power, 4) trust in government, 5) trust in utility companies and pro- and anti-nuclear group membership.

PURPOSE: The purposes of this study were to: 1) develop a valid, reliable test instrument to be used for the purpose of measuring selected attitudes toward nuclear power, 2) determine whether or not attitudinal differences exist between selected groups of people, 3) describe any group differences in attitude, 4) classify members of selected groups as either anti- or pro-nuclear.

SUBJECTS: Mail responses were obtained from several sample populations: anti- and pro-nuclear special interest groups in sections of central and southwestern Ohio and northern Kentucky, and a random sample of the general public living in and around Columbus, Ohio. Over 300 responses were received, providing a response rate of over 60%.

RESEARCH DESIGN: A 44 item Likert-type instrument with sub-scales for each of the attitudinal variables was developed prior to this survey. A five-point scale was used. Data were transformed to a 2-point (polychotomous) scale in parts of the study to meet statistical requirements. Reliability coefficients greater than 0.80 were obtained. Validity was discussed.

RESULTS: Discriminant analysis consisting of three parts, significance testing, explanation or description, and classification, was performed. In significance testing, both MANOVA and ANOVA procedures were used and revealed differences ($p<0.001$) between pro- and anti-nuclear groups on each sub-scale and the test as a whole. In explanation or description a discriminant function was derived to describe the relative importance of each sub-scale in explaining the overall difference of attitude between the pro- and anti-nuclear groups. Classification functions were derived and classification scores were obtained for each subject who was a member of one of the interest groups. Each subject was classified correctly using these scores, which served as a check on the adequacy of the discrimination function. The same analysis was repeated on the random sample of the general population. Group memberships (pro- and anti-nuclear) were assigned using the classification functions. Sub-scales appeared to represent areas of disagreement among population segments as well as between special interest groups. The hierarchy of the sub-scales, and thus the relative importance of the issues, was similar between the special interest groups and between the two segments of the general population. The relative importance of the issues represented by the five sub-scales in accounting for differences in attitudes towards nuclear power was found to be about the same within the general population as between the special interest groups. Practical considerations of health and safety and the need for nuclear power were of more concern and are more responsible for differences in attitude than were issues of faith in institutions. Significant differences in attitude due to sex ($p<.001$) and education ($p<.003$) were also found. Discriminant analysis was found to provide the researcher with a unique ability to determine which issues contribute most to differences in attitudes between groups.

REFERENCES: 3 cited

072. Glass, L. W. (1981). Outcomes of an energy education workshop for secondary school science teachers. School Science and Mathematics, 81(6), 496-502.

DESCRIPTORS: Teacher education inservice, program evaluation, pre-experimental research, formal, knowledge, attitudes, energy education

VARIABLES: Energy education workshop, knowledge and attitudes about energy.

PURPOSE: To measure the cognitive growth, stated attitude change, and retention of knowledge and stability of attitudes about energy one year after attending an Energy Education Workshop.

SUBJECTS: Twenty-five (25) secondary school teachers were selected, from all the applicants, to attend a National Science Foundation sponsored energy education workshop. The criteria for selection were not specified.

RESEARCH DESIGN: The pre-experimental design employed was a one-group pretest/posttest design followed by a delayed posttest. All subjects were pre-tested at the beginning of the workshop. Instruction consisted of content and activities in the areas of sources of energy, demands for energy and energy decision-making. Energy decision-making included alternative sources of and uses for fuels, energy and politics, and energy and the gross national product. Thirty evenings of instruction were given over a nine month period after which the subjects were post-tested. One year later, the same instrument was administered as a delayed posttest. The Energy Inventory developed by Biological Science Curriculum Study (1977) was used as the pre-test, posttest and delayed posttest instrument. The instrument measures knowledge, skills, and attitudes in the area of energy. The Kuder-Richardson formula 20 reliability coefficient for the instrument is .84. No validity data were reported.

RESULTS: Means and standard deviations were calculated for the knowledge and attitude scales and sub-scales on the pretest, posttest, and delayed posttest. A t-test comparison of the pretest posttest means indicated that during the course of the workshop, significant growth occurred on the knowledge scale ($p<.01$) and a significant change in attitudes ($p<.01$) in the direction deemed appropriate by the developers of the Energy inventory. The delayed posttest results showed that the energy knowledge of the participants and their stated energy attitudes remained relatively stable in the twelve months following the workshop. The standard deviation was approximately the same on the posttest (3.17) and the delayed posttest (3.35) scores of the total knowledge score. On the total attitude score the means changed by one point and the standard deviation increased (3.90 posttest to 4.76 delayed posttest). Tables containing sub-scale data for all measurements were provided. Inferences regarding lack of significant change on the individual responsibility variable were presented.

REFERENCES: 13 cited

073. Glass, L. W. (1984) Wanted: More student involvement activities in energy education. School Science and Mathematics, 84(8), 644-648.

DESCRIPTORS: Issue awareness/knowledge of issues, program evaluation, teacher education inservice, descriptive research, knowledge, perceptions/beliefs, energy education.

VARIABLES: Perceived needs related to energy education.

PURPOSE: To identify the perceived energy education needs of a random sample of teachers.

SUBJECTS: Four hundred (400) names of past energy education workshop participants in Iowa were selected randomly to participate in a mailed questionnaire study. Forty five (45%) percent of the questionnaires were returned, 136 from teachers and 43 from administrators, curriculum directors, and other non K-12 classroom teachers.

RESEARCH DESIGN: A 52 item questionnaire was designed to elicit information in three broad areas: evaluation of the energy education workshop attended, identification of beliefs and practices concerning energy education, and identification of perceived knowledge needed in energy education.

RESULTS: Within the top five needs, elementary teachers and secondary teachers identified needs for "hands-on" activities in energy education, action projects for teaching energy education, availability of support materials for teaching energy education, and knowledge of the environmental and biological effects of radiation. The five lowest ranking items generally included principles and content form the social sciences and physical science. Concepts and goals necessary for developing curriculum materials and values clarification activities also ranked in the lowest five by secondary teachers and elementary teachers respectively.

REFERENCES: 5 cited

074. Glenn, A. D. & Gennaro, E. D. (1981). Attitudes of science and social studies teachers toward interdisciplinary topics and value questions. School Science and Mathematics, 81(6), 451-458.

DESCRIPTORS: Middle/junior high, secondary, teacher education inservice, descriptive research, interdisciplinary, attitudes, social studies education, science education, issue-based

VARIABLES: Teacher's attitudes.

PURPOSE: To gather information about science and social studies teachers' attitudes with respect to dealing with interdisciplinary topics and value issues in the classroom and to raise questions for further research.

SUBJECTS: Junior and senior high school science and social studies teachers in a large metropolitan school district in Minnesota. Ninety-six (96) of 200 social studies teachers surveyed and 56 of 88 science teachers surveyed returned their questionnaires.

RESEARCH DESIGN: In this descriptive pilot study, data were collected via questionnaires. The questionnaires were designed by the authors. No validity or reliability data were reported. The questionnaire was designed to focus on two areas; attitudes and factors that influence efforts to teach interdisciplinary topics and attitudes about teacher preparation and teaching strategies related to dealing with value issues in the classroom. Frequencies and percentages of respondents agreeing, disagreeing, and expressing no opinion on the questions posed were reported for selected questions at the junior and senior high levels.

RESULTS: It was found that teachers in science and social studies had a favorable attitude toward interdisciplinary teaching. Most believed such topics had a place in the classroom. Specific differences in attitudes were discussed in the areas of sufficient teaching time, student background knowledge and ability, and teacher background knowledge and ability. It was also found that teachers felt that value issues have a legitimate place in both the science and social studies curriculum. Teachers in both content areas believe they have a knowledge of specific teaching strategies and the overall preparation needed to deal with such issues. Recommendations for further research are made in the areas of teacher attitudes, teacher behavior, teacher knowledge, and student outcomes.

REFERENCES: 2 cited

075. Glenn, W. H. (1990). Treatment of selected concepts of organic evolution and the history of life on earth in three series of high school earth science textbooks, 1960-1989. Science Education, 74(1), 37-52.

DESCRIPTORS: Secondary, descriptive research, science education.

VARIABLES: The treatment of evolution in high school earth science textbooks.

PURPOSE: To detect any major changes in the extent or quality of treatment of evolution and related topics in selected textbooks.

SUBJECTS: The various editions of three high school earth science textbooks published during the 1960s, 1970s, and 1980s.

RESEARCH DESIGN: Descriptive study with preliminary examination of the presence of the terms evolution, natural selection, and Charles Darwin in the index, glossary, and text of all editions of each textbook was followed by detailed reading and content analysis of selected texts (early-mid 60s and mid-late 80s editions) for the topics of: 1) origin of life, 2) evidence for evolution, 3) theories of evolution, 4) human evolution, and 5) evolution and creationism.

RESULTS: Less coverage of the history of life on earth was found in the 80s than in the 60s. One textbook clearly explains the theory of evolution, while in the other two the term evolution and mention of Darwin's name are uncommon. All three texts de-emphasize the origin and evolution of humans.

REFERENCES: 3 cited

076. Griffin, J. (1989). Communication and the adoption of energy conservation measures by the elderly. The Journal of Environmental Education, 20(4), 19-28.

DESCRIPTORS: Issue awareness/knowledge of issues, citizenship action, non-formal, descriptive research, trend analysis, educational background, economic background, non-formal, behaviors, energy education

VARIABLES: Age of respondents, educational level, income, age of dwelling, number of inhabitants, processing television energy information, frequency of reading utility bill-insert pamphlets and frequency of discussing energy use with other persons not in household.

PURPOSE: To determine the relationship of communication to adoption of energy conservation behavior among homeowners.

SUBJECTS: A total of 813 homeowners took part in the study In 1981, 351 single family-homeowners were interviewed, in 1982, 227 (65%) of the original members were reinterviewed, and an additional 181 were added and interviewed in 1982, in 1983, 307 (75%) of the 1982 respondents were again interviewed, and an additional 118 were added and interviewed. In 1986, 245 (61%) of the 1983 respondents were reinterviewed and 160 new respondents were added. Over 65 years of age were considered older and under 65 were considered younger.

RESEARCH DESIGN: In this descriptive research a series of telephone interviews and re-interviews were conducted in four waves, with added control groups each year. It started in 1981 and continued in 1982, 1983 and was finished in 1986.

RESULTS: From 1981 to 1983 the heat factor data indicated that older respondents used more energy for heat, however older respondents appeared to adopt attitudes oriented to conservation of energy in the later years of the study. Both younger and older respondents were equal in the importance and knowledge they placed on energy problems. In 1983, older respondents discussed home energy use outside the home less than younger respondents ($p < .05$). Communications media bear more relationship with energy behavior in younger respondents. However, utility audits, pamphlets and requests for energy information gave a stronger relationship with all respondents than did television and newspaper stories. The results indicate educators should concentrate energy education efforts on adult learners. There were no recommendations for further research.

REFERENCES: 28 cited

077. Griffin, R. J. & Schoenfeld, C. (1982). Environmental impact: University programs in journalism. The Journal of Environmental Education, 14(1), 4-10.

DESCRIPTORS: Higher education, cognitive, program development, program evaluation descriptive research, formal

VARIABLES: Curricular offerings, journalism internships, service, faculty, and future relationships to the environmental era of universities offering journalism or mass communications programs.

PURPOSE: To investigate how schools and departments of journalism and mass communication have reflected and integrated content of the environmental era, since these schools are responsible for the preparation of mass media personnel charged with investigating and interpreting environmental issues.

SUBJECTS: 256 undergraduate departments of journalism and mass communication in the U.S. Deans or department heads were requested to complete the instrument. 171 usable responses (67%) were received. A second instrument sent to the same schools also received a 67% response rate with 75% being from respondents to the first survey and 54% (sic) from the non-respondents.

RESEARCH DESIGN: A first questionnaire was set in the fall of 1980. It was designed to measure various aspects of the inclusion of environmentally-related materials and activities in the curriculum internship and placement programs, public service, faculty interests and institutional liaisons in journalism and mass communication programs at colleges and universities in the U.S. A second questionnaire was sent to gain further data regarding enrollments and the frequency the various kinds of journalism-related courses were offered. Inter-coder estimates of reliability are cited.

RESULTS: Data were analyzed using descriptive statistics. Also, hierarchical regression analysis was used to investigate the variables related to the inclusion of environmental materials in journalism curricula, environmental placement and service activities, environmentally-interested faculty and future environmental commitment in journalism programs. The authors conclude that the impact of the environmental era has been to define environmental issues as matters of public debate and policy; that faculty interested in the environment seem to play a key role in the frequency that environmental reporting courses and service workshops for the working press are offered as well as the maintenance of internships with environmental agencies and organizations. Although some statistically significant relationships were found, only moderate amounts of variance were accounted for by the predictor variables in all dependent variables. The authors recommend more study of the factors that lead to curriculum change in areas as diverse as energy and women's studies; the role of committed faculty in those changes and the effects on institutions and students.

REFERENCES: 15 cited

078. Gunn, W., & Horvath, P. (1987). The effects of an anti-nuclear war film on attitudes toward nuclear issues. The Journal of Psychology, 121(6), 615-622.

DESCRIPTORS: Higher education, affective, experimental research, formal, attitudes, issue-based

PURPOSE: To test the effects of an anti-nuclear war film on students' attitudes toward nuclear issues.

SUBJECTS: Twenty-six male and female Canadian undergraduates were shown the film "If You Love This Planet", while another 26 were shown a neutral film "This Is An Emergency".

RESEARCH DESIGN: Random assignment of equal number of male and female subjects, in accordance with a posttest-only, control design. The six scales measuring attitudes toward nuclear issues included: attitudes concerning personal sacrifice for one's country, death anxiety, helplessness, future life, denial of the problem, and activism. Two-way analysis of variance (Films x Gender) were carried out on the six scales.

RESULTS: Students who saw the experimental film (M = 3.15) showed more support for activism and protest against nuclear was than did those who saw the control film (M = 3.81), F(1,48) = 5.27, p<.05. There were no other effects on the activism. The study provided evidence that a film can influence activist attitudes toward nuclear issues and that such attitudes are based more on self concern than on altruistic concern about one's country. The study also found that males tended to be more optimistic than females about the future of the human race, F(1,48) = 5.32, p<.05, and more willing than females to sacrifice themselves for their country, F(1,48) = 4.82, p<.05.

REFERENCES: 23 cited

079. Gunter, V. J. & Finley, B. (1988). Influences on group participation in environmental conflicts. Rural Sociology, 53(4), 498-505.

DESCRIPTORS: Citizenship action, descriptive research, issue-based, issue identification and analysis skills, values

INDEPENDENT VARIABLES: Membership in pro-environmental and non-environmental groups, monetary concerns, health concerns, aesthetic and preservation concerns.

DEPENDENT VARIABLES: Support for environmental interests.

PURPOSE: To determine the extent that non-environmental groups actively support environmental interests. To determine whether the non-environmental groups are more likely to express support if they perceive threats to their health or monetary interests than if they perceive threats to the non-human environment.

SUBJECTS: Newspaper articles were obtained from the Texas Coastal and Marine Council Clips/Briefs which reprints newspaper articles on coastal issues from major state newspapers, local newspapers of Texas coastal communities, and other sources. There were 38 cases identified.

RESEARCH DESIGN: Articles were collected from Clips/Briefs from 1977 through 1983 and used to create files on site-specific environmental conflicts on the Texas coast. Sample cases included all environmental disputes over new, existing, or expanding projects. All conflicts involved at least one environment-oriented citizen action group. Each article was analyzed and coded according to variables listed. Validity and reliability estimates were not reported.

RESULTS: Most common pro-environment groups were local and county governments, grassroots environmental organizations, state and federal regulatory agencies, and state and federal elected officials. The most common non-environmental groups were business and federal and state regulatory agencies.

Monetary concerns were most often expressed by occupational organizations. Health and safety concerns were voiced most often by local and county governments, state and federal elected officials, business, and grassroots environmental organizations. Aesthetic and preservation concerns were most likely to be expressed by national environmental organizations, their local chapters, and by state and federal regulatory agencies.

Opposition to projects was most frequently expressed by non-environmental groups when perceived threats to health and safety were encountered. Opposition to projects by environmental groups occurred more frequently with perceived threats to aesthetic and preservation concerns.

REFERENCES: 9 cited

080. Ham, S. (1983-1984). Communication and recycling in park campgrounds. The Journal of Environmental Education, 15(2), 17-20.

DESCRIPTORS: Citizenship action, program evaluation, naturalistic research, unobtrusive research, non-formal, values, behaviors

VARIABLES: Written instructions given at trash receptacles.

PURPOSE: The purposes of this study were: 1) to determine whether campers at Canby State Park read instructions before emptying their garbage; 2) to determine whether they sorted and disposed of their garbage according to instructions; and 3) to determine if sorting instructions were clear, or if campers have trash separated into categories before going to disposal sites.

SUBJECTS: One hundred fourty seven (147) campers who used trash disposal stations at Canby State Park in the state of Washington.

RESEARCH DESIGN: The research design was naturalistic, using both observation logs and interviews. One hundred-fourth-seven campers were observed, then questioned during a two day period on July 29 and 30, 1981. Observation continued over a nine hour period at two separate waste disposal stations. Observation periods were not randomly selected. Data were offered for descriptive purposes only.

RESULTS: Out of 147 campers surveyed, only about 81 seemed to read instructions for trash disposal that would permit recycling. Thirteen of the non-readers separated and deposited trash correctly. It was determined that they had learned this previously. Of those who read, only 43 disposed of their garbage correctly. Also only 12 of those who read instructions said they were clear enough to understand. The researchers concluded that separating trash for recycling won't be effective without clear instructions. There is also a need to create a greater awareness of the recycling effort.

REFERENCES: 9 cited

081. Ham, S., & Sewing, D. (1987-1988). Barriers to environmental education. The Journal of Environmental Education, 19(2), 17-24.

DESCRIPTORS: Elementary, teacher education inservice, affective, naturalistic research, perceptions/beliefs, attitudes, science education.

VARIABLES: Conceptual barriers, logistical barriers, educational barriers, and attitudinal barriers to the teaching environmental education in the elementary school.

PURPOSE: To identify and determine the relative importance of barriers to environmental education (EE).

SUBJECTS: A total of 91 randomly selected elementary teachers from 6 school districts in the Paluse region of eastern Washington and western Idaho participated in the study. Of the teachers interviewed, 89% were females. The participant's average teaching experience was 13.8 years.

RESEARCH DESIGN: A naturalistic (interview) research design was utilized. A structured interview containing questions corresponding to each study objective was designed, pretested, and finalized before the data collection. The interviews contained both open-ended and closed response items.

RESULTS: Respondent's answers to the interviewers' questions were categorized and the percentage of respondents in each category was calculated. The findings were: 1) the primary barrier to teaching environmental education (EE) was the lack of time, both in the school day and for preparation; and 2) other important barriers to teacher environmental education were the lack of instructional materials and lack of funding, exclusive focus on science and an emphasis on the cognitive aspects of EE, and teachers' misgiving about their competence to teach environmental education. To reduce the barriers toward environmental education, the researcher recommended that an effort should be directed toward integrating environmental education into other curriculum areas besides science.

REFERENCES: 26 cited

082. Hamilton, L. C. (1985). Self-reported and actual savings in a water conservation campaign. Environment and Behavior, 17(3), 315-326.

DESCRIPTORS: Citizenship action, experimental research, unobtrusive research, educational background, economic background, knowledge, behaviors, conservation education.

VARIABLES: Knowledge of household water use, degree of effort made to conserve water, socioeconomic status.

PURPOSE: To determine if self-reports are related to actual changes in water consumption.

SUBJECTS: A mailed survey questionnaire combined with water consumption figures from utility billing records was sent to 471 households in the city of Concord, New Hampshire. The response rate was 67% and careful testing revealed no evidence of sample bias.

RESEARCH DESIGN: Tabular methods were used to examine the relationship between self-reported and actual change in water use. The survey questionnaire contained an item asking, "Comparing last summer (1981) with the summer before that (1980), do you think your household's water use increased, decreased, or stayed about the same?" Subtracting summer 1980 use from summer 1981 use provides an objective measure of change.

RESULTS: Respondents were correct about their water use more often than chance would allow, although the tendency toward accuracy is not strong. A minority of the respondents (42%) accurately reported their use. Self-reports were related to a number of background variables in addition to actual water use. Reports that use "increased" or "decreased" were significantly more likely in more affluent, better-educated, and young households. Older, poorer, and less well educated households were more likely to report "stayed same" or "don't know". The accuracy of self-reports increases with both socioeconomic status and the level of conservation behavior. Thus, those who tried to conserve water were more accurate in their self-reports than were those who do not try to conserve. One strong conclusion that can be reached from this analysis is that self-reports should not be trusted as proxies for objective water consumption.

REFERENCES: 19 cited

083. Hammerman, E., & Voelker, A. (1987). Research based objectives for environmental education: Consensus on the past; A base for the future. Science Education, 71(1), 29-40.

DESCRIPTORS: Environmental sensitivity, issue awareness//knowledge of issues, issue identification and analysis skills, values clarification, citizenship action, cognitive, affective, psychomotor, descriptive methods.

interdisciplinary

VARIABLES: Environmental education objectives.

PURPOSE: To recount the development of consensus environmental education objectives in the United States since 1970, and to compare these to international environmental education objectives set forth at the 1977 UNESCO sponsored International Conference on Environmental Education in Tbilisi, Georgia, USSR.

SUBJECTS: Experts in environmental education, conservation education, and outdoor education from universities, governmental agencies, business, industry, schools, private agencies, and citizen groups were identified by the 50 state environmental education coordinators in 1978. From a list of over 100 experts 58 agreed to participate.

RESEARCH DESIGN: The paper is a summary of the study (Hammerman, 1979) in which the Delphi Technique was used to reach consensus among experts regarding the most important environmental education objectives. The Delphi Technique, a method for systematic soliciting and combining of opinions, features; 1) anonymous response to a formal questionnaire, 2) interaction and controlled feedback, 3) statistical group response where group opinion is defined as an aggregate of individual opinions. Validity and reliability estimates were not discussed.

RESULTS: This study resulted in a consensus of 10 high priority environmental education objectives for the United States. These 10 objectives elaborated on the Tbilisi objectives. The authors discuss the usefulness of and implications of the Hammerman objectives for the future of environmental education.

REFERENCES: 17 cited

084. Hammitt, W. (1984). Cognitive processes involved in conventional interpretation. The Journal of Environmental Education, 15(4), 11-15.

DESCRIPTORS: Cognitive, hypothesis generation, descriptive research non-formal, knowledge, outdoor education

VARIABLES: Interpretive sign messages. The recognition score for the content of messages found along interpretive forest trails.

PURPOSE: The purpose of the study was to show that environmental interpretation is an information approach to educating, where familiarization and recognition are appropriate means of cognitive evaluation.

SUBJECTS: One hundred-fifty daytime hikers in the Great Smokey Mountain National Park. A quota of 38 hikers (one per hiking party) was sampled per day, with sampling designed to cover the hours of 10 a.m. to 5 p.m. each day. Field logistics prohibited a randomly drawn sample. Sampling days were randomly selected.

RESEARCH DESIGN: A descriptive design using a questionnaire approach was used. The procedure included eight black and white photographs of the dominant environmental scene at the location of each sign. There were three statements concerning the message content on each. The hikers were asked to indicate whether the statements seemed true or false to them. A five point Likert format was used where 1 = definitely false, 2 = probably false, 3 = not sure, 4 = probably true, 5 = definitely true. Respondents were given a familiarity score equal to the degree of correctness they have for the statements.

RESULTS: Seventy-three percent of the hikers questioned were able to recognize 70% or more of the content of the messages. Only 10% of the hikers scored less than 60% correct. Ninety percent (90%) of the hikers gave a positive reaction to the presence of the signs. Results tend to indicate a good degree of visitor familiarity and recognition for message content which they experienced during an interpretive encounter.

REFERENCES: 10 cited

085. Hart, E. P. (1981). Identification of key characteristics of environmental education. The Journal of Environmental Education, 13(1), 12-16.

DESCRIPTORS: Model building, historical research, theoretical research, formal, non-formal.

VARIABLES: Criteria, years, sources, key phrases

PURPOSE: To identify key characteristics of environmental education (EE) in order to help improve the conceptualization of EE and thus contribute to the theoretical foundation on which meaningful research, evaluation and curriculum development could be based.

SUBJECTS: This study delimited the EE literature to include only those documented under the descriptor 'EE' by Educational Resources Information Center (ERIC), in the following publications: Current Index to Journals in Education (CIJE), Resources in Education (RIE) for the years 1966 through 1978 and EE documents distributed by the ERIC clearinghouse for EE.

RESEARCH DESIGN: Prerequisite to acceptance of descriptors as characteristics of EE each element must have exhibited inclusion within an EE descriptor and actual statements that exemplars were considered to be elements of EE. The next step consisted of the systematic examination of the literature using frequency of occurrence, uniformity of occurrence, consistency or resistance to change, limited variation in approach, and ease and consistency in interpretation. More specifically, to be considered a key component of EE, the characteristic must have been stated as a core element by all of the following: at least one major conference or workshop initiated by a major, recognized sponsoring agency at the national level; at least ten individuals or groups of individuals writing in refereed journals, listed through CIJE or published in books which refer to journal articles in EE; and at least ten individuals writing in articles abstracted in RIE or in published

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books which describe EE programs. The author stated that reliability and validity threats were reduced by following the above procedures.

RESULTS: As a result of applying the criteria described above (C), 25 key characteristics were identified and briefly described. They include: Interdisciplinary, Multilevel, Global Views, Concepts (ecological-environmental), Process Development (cognitive, affective, skill-behavior), Problem Solving, Values Clarifying, Systems Thinking, First-hand Experiences and Activities, Present and Future Orientation, Environmental Issue Orientation, Active Participation (in preventing/solving problems), Individual Learning, Team Approach to Teaching/Learning, New Productive Student Teacher Relationships, Community Oriented, Field Studies (urban and natural environments), Communications Networking, Coordination and Cooperation (International, national, regional, and local), Flexible Administrative Organizational Patterns, Reform of Education Processes and Systems, Curriculum Development Base, Curriculum Evaluation Base, Research Base, Teacher Evaluation. A more detailed explanation of each characteristic is available from the author. The author stated, conclusions and educational implications, and implied recommendations for further research.

REFERENCES: 9 cited

086. Hartman, L., & Hanna, J. (1987). Interpretive education courses in the United States and Canada. The Journal of Environmental Education, 18(4), 1-8.

DESCRIPTORS: Higher education, program evaluation, descriptive research

VARIABLES: School location and students, degrees and majors offered, courses, content, and text, course content.

PURPOSE: To summarize statistics from the Directory of Interpretive Curricula in the United States and Canada and to offer some recommendations for further research.

SUBJECTS: Eighty (80) institutions of higher education from the United States and Canada which have some type of interpretive instruction.

RESEARCH DESIGN: A descriptive design utilized a questionnaire which gathered information about interpretive instruction.

RESULTS: Seventy-three of the schools offered 130 classes with the word "interpretation" in the course title, description, or required textbook title. Six institutions offered a major in environmental interpretation, and 24 others offered a specialization. Eleven offered a master's degree with a specialization in environmental interpretation, and 6 offered a PH.D. Seventy-five% of the interpretive course content deals with interpretive practices and techniques. Recommendations include a stronger emphasis on practical experience outside the classroom.

REFERENCES: 17 cited

087. Hayes, S. C., & Cone, J. D. (1981). Reduction of residential consumption of electricity through simple monthly feedback. *Journal of Applied Behavior Analysis*, *14*(1), 81-88.

DESCRIPTORS: Citizenship action, affective, experimental research, unobtrusive research, behaviors, energy education.

INDEPENDENT VARIABLE: Monthly feedback to consumer of electricity consumption.

DEPENDENT VARIABLE: Raw kilowatt-hours consumed, consumption percent change compared to previous year.

PURPOSE: To determine the effects on electrical consumption of monthly feedback which was considered economically feasible.

SUBJECTS: Forty (40) non-volunteer families and twenty (20) volunteer families who were consumers of the Blackstone Valley Electric Co. (Pawtucket, Rhode Island) were chosen by a random drawing of account numbers. Because account numbers are arranged by area, this produced two participants, geographically matched to each volunteer. Two groups of non-volunteer consumers were formed by randomly assigning one of each N and (N plus N') pair to a baseline-only control condition and the other to a monthly feedback condition.

RESEARCH DESIGN: This experimental study was conducted so as to permit both within- and between-group comparisons. There were two initial baseline periods. The monthly feedback condition was implemented in the experimental group for six months. The feedback was in the form of a letter informing the consumer of the percent of increase or decrease in usage compared to the previous year. A final withdrawal phase was conducted. The control group remained in the baseline phase throughout the study. Reliability of meter readers was determined to be 99.9% based on consumer and computer located errors.

RESULTS: The data showed a clear decrease in electricity consumption for the feedback group during the feedback phase. The effect was maintained during a four-month intervention period. Withdrawal of the feedback was associated with a return to higher levels of electricity consumption. In order to assess the statistical significance of these effects, a 2 (groups) by 3 (phases: baseline, treatment, baseline) ANOVA with three repeated measures was conducted on the mean percent change scores for the relevant phases. Results showed no significant effect for groups, $F = 13$, $p<.10$, or phases, $F = 1.05$, $p<.10$, but there was a significant group by phase interaction, $F = 3.19$, $p<.05$. The use of geographically matched non-volunteer consumers enabled a comparison of consumption patterns of volunteers versus non-volunteers. The two groups used virtually identical amounts of electricity during the compared baseline period.

REFERENCES: None cited

088. Hecht, P. R., Durdan, C. A., & Reeder, G. D. (1985). Litter in a university cafeteria demographic data and the use of prompts as an intervention strategy. Environmental and Behavior, 17(3), 387-404.

DESCRIPTORS: Higher education, experimental research, unobtrusive research, behaviors

VARIABLES: Evaluative tone of the written prompt, specificity of the written prompt, size of the group, sex, age, and proximity to facilities.

PURPOSE: To determine if prompts can increase the busing behavior of cafeteria patrons, to evaluate the effectiveness of different messages conveyed by the prompt, to determine if the size of the group influences the busing behavior of the patrons, and to examine the influence of several other demographic variables, specifically sex, age, and proximity to facilities.

SUBJECTS: The target population was made up of cafeteria users at Illinois State University. Most subjects were students, faculty, or staff of the university. Of the subjects, 51% were male and 49% were female. By age, 67% were under age 25, 33% were age 25 and older.

RESEARCH DESIGN: The study consisted of an initial baseline observation period, a prompt intervention, and a second base-line. A total of 2,352 observations were made between 11:30 a.m. and 1:00 p.m. on weekdays. A single observer recorded data during any given time period. An observation was made each time a patron left his or her table to exit the cafeteria. During the prompt intervention period, two dimensions of prompting were represented: Evaluative tone (positive versus negative) and specificity (general versus specific). A subject of data from the initial baseline was scored for reliability. Percentages of agreement were calculated. The prompt data were examined by a three-way log-linear analysis.

RESULTS: There was a significant decline in food-related litter when prompts were in effect. Positively worded prompts were found significantly more effective than negatively worded prompts. The specificity of the prompt did not affect litter behavior. An individual member of a large group was more prone to litter than a member of a smaller group. The data indicated that males litter slightly more than females. However, both sexes littered less when prompts were in effect. Older subjects tended to litter slightly more than those under age 25. However, older patrons littered significantly less after the prompts were withdrawn. Litter rates also decreased as patrons sat closer to waste facilities. Future research might focus on settings with a more diverse age range such as cafeterias in elementary schools, industries, or nursing homes. Research is also needed to clarify the finding that individuals litter more as group size increases and what role modeling processes play in this finding.

REFERENCES: 25 cited

089. Heslop, L. A., Moran, L., & Cousineau, A. (1981). 'Consciousness' in energy conservation behavior: An exploratory study. Journal of Consumer

Research, 8, 299-305.

DESCRIPTORS: Citizenship action, descriptive research, attitudes, personal responsibility, behaviors, conservation education, energy education

INDEPENDENT VARIABLE: Price consciousness, average family size, and attitudes.

DEPENDENT VARIABLE: Energy use.

PURPOSE: To examine the relationship of various attitudes and demographic variables to electricity conservation behavior in a period of rapidly rising prices.

SUBJECTS: The sampling population was defined by those living at least six years' duration in the same dwelling in the midsize southwestern Ontario city of Guelph. A random list of 1,000 occupants was compiled from city directories. Occupants were then contacted by mail to request participation in the study. 164 permission forms were returned and questionnaires were mailed to this group. Only 144 were returned and 8 were deleted from the study due to incompleteness or because respondents heated totally by electricity. The latter was thought to be atypically sensitive to electricity issues.

RESEARCH DESIGN: This study examined the effects of price consciousness, social consciousness, energy conservation consciousness, environmental consciousness, and various demographic and household characteristics on the following dependent variables: changes in kilowatt-hours over the six year period, acceptability of policy alternatives to restrict consumption, and kilowatt-hour consumption of households for each year between 1973 and 1978. Actions taken to conserve energy was treated as both independent and dependent aspects of the data analysis.

RESULTS: The results are based on the data from the questionnaires as well as secondary data in the form of electricity records for 1973-78.

In the demographics, only income was significantly correlated with consumption. Partial regression coefficients for the number of electrical appliances, number of people in the household, and price consciousness were significant at the .05 level. In addition, perceived price increases, policy alternatives acceptability, average family size, price consciousness, conservation knowledge, and income had significant partial correlation coefficients.

It was concluded that personal sensitivity to price increases appears to be much more relevant to energy-use behavior than the consciousness variables more commonly used in energy studies. Also, the stock of capital goods, household size are major determinants of energy use, and price-related attitude variables seem to be very important.

REFERENCES: 26 cited

090. Hines, J., Hungerford, H., Tomera, A. (1986-1987). Analysis and synthesis of research on responsible environmental behavior: A meta-analysis. The Journal of Environmental Education, 18(2), 1-8.

DESCRIPTORS: Citizenship action, model building, synthesis of research, educational background, economic background, knowledge, attitudes, locus of control/efficacy, verbal commitment/intention, personal responsibility, behaviors

INDEPENDENT VARIABLES: Verbal commitment, locus of control, attitude, personal responsibility, knowledge, educational level, income, economic orientation, age, gender, behavioral intervention strategies (incentives, appeals, information, feedback).

DEPENDENT VARIABLE: Responsible environmental behavior.

PURPOSE: To analyze and synthesize the environmental behavior research (post-1971), in an effort: (1) to identify variables strongly associated with responsible environmental behavior, (2) to determine the relative strengths of the relationships between each of these variables and environmental behavior, and (3) to formulate a model of environmental behavior based on the synthesized findings.

SUBJECTS: An exhaustive search of the literature was facilitated by the use of over 15 secondary sources. Ultimately, 128 studies comprised the data for this study. Prior to this, 187 studies were discarded due to age, and 65 others were not available.

RESEARCH DESIGN: Information was extracted from the studies and recorded on coding sheets according to pertinent characteristics and findings. Schmidt-Hunter meta-analysis procedures were used to analyze and synthesize the extracted data.

RESULTS: Where possible, the values obtained from the meta-analysis were corrected for errors due to sampling/reliability differences between studies. Moderate variables were also scrutinized. Fifteen separate variables were meta-analyzed, of which the following were found to be associated with responsible strategies, locus of control, attitudes, verbal commitment, and an individual's sense of responsibility. The flow chart-style model developed from the date indicated that environmental educators may influence several important component areas of strategies, and action skills may be enhanced through educational efforts. To a lesser degree, personality factors may be influenced as well.

REFERENCES: 25 cited

091. Hofman, H., & Glass, L. (1982). Three studies for evaluating energy education curricular materials. School Science and Mathematics, 82(6), 481-489.

DESCRIPTORS: Issue awareness/knowledge of issues, secondary, teacher education inservice, descriptive research, formal, perceptions/beliefs, attitudes, energy education.

VARIABLES: Attitudes toward energy conservation, student perception of quality of units, perceived usefulness of materials, infusibility of materials, content of materials.

PURPOSE: The purpose of this article was to report findings from three studies that reviewed and evaluated the Project for an Energy-Enriched Curriculum (PEEC) materials and to present information about a pilot study in which students were asked to give their perceptions of the quality and usefulness of selected energy education units. In addition, a report is included on an instrument developed to evaluate the PEEC materials.

SUBJECTS: Study I: Teachers attending an NSTA convention were asked to complete a questionnaire and to participate in personal interviews. Study II: Two thousand randomly selected secondary teachers selected from the National Registry of Teachers were surveyed. Study III: Students (n=728) of high school teachers from 10 school districts in Iowa who were involved in an NSF energy education workshop were surveyed.

RESEARCH DESIGN: Subjects in Studies I & II were administered a questionnaire. Teachers were asked how well the PEEC materials fit into their existing programs, the extent to which teacher training on the materials is needed, and the appropriate technical and reading levels of the materials.

Study III: Teachers were trained in the use of PEEC materials and volunteered to field-test these units with their students. At the completion of each PEEC unit, a questionnaire was administered by each teacher to students in their field-test classes to assess student perceptions of the quality of the units, students' attitudes toward the energy situation, and toward school and learning.

An instrument was developed to evaluate the PEEC in the areas of reading levels, subject areas, energy content areas, treatment of controversial issues, and teaching strategies.

RESULTS: The teachers surveyed in Studies I & II indicated that they felt the PEEC materials would fit well into existing programs, that it would not be necessary for teachers to be specifically trained to use the materials, that the technical aspects of the program were appropriate as were the reading levels. Teachers who reported having used the materials reported generally favorable evaluations, especially in increasing students' energy awareness.

In general, the findings from Study III showed that students confirmed what adults said about the PEEC materials; the materials were interesting and made them aware of energy.

The materials evaluation showed that the reading levels were for the most part appropriate, that teaching strategies included the use of problem-solving and decision making along with applications of energy education to students' local situations.

REFERENCES: 5 cited

092. Honnold, J. (1984). Age and environmental concern some specification of effects. The Journal of Environmental Education, 16(1) 4-9.

DESCRIPTORS: Affective, hypothesis generation, descriptive research, trend analysis, environmental sensitivity, attitudes, beliefs.

VARIABLES: Aging, period effects, cohort effects, environmental concern.

PURPOSE: To investigate whether aging, period effects, and cohort effects have an influence on environmental concern.

SUBJECTS: Eight groups of individuals with birth dates from 1949-55, 1942-48, 1935-41, 1928-34, 1921-27, 1914-20, 1907-13, and 1906 or earlier. N size was not reported.

RESEARCH DESIGN: Descriptive research involving a cross-sectional analysis of information obtained from the National Opinion Research Center General Social Surveys from 1973 to 1980. Longitudinal data were also analyzed from the NORC.

RESULTS: Aging-period-cohort analysis using percentages indicated that "too little" is being spent on environmental improvement and protection. Environmental concern has declined in all age groups. Larger longitudinal and time-lag than cross-sectional differences are found for six of the eight analysis groups. Aging processes may play a critical role at transitional life cycle stages, e.g., from young adult to mature adult. Some combination of aging and cohort effects may account for the slight observable cross-sectional differences between age groups, but changes in environmental attitudes in most age groups since the early 1970s are probably the result of period effects.

REFERENCES: 10 cited

093. Hooper, J. (1988). Teacher cognitions of wildlife management concepts. The Journal of Environmental Education, 19(3), 15-18.

DESCRIPTORS: Ecology education, issue awareness/knowledge of issues, elementary, middle/junior high, secondary, teacher education inservice, cognitive, descriptive research, knowledge, resource management education

VARIABLES: California school teachers' knowledge of wildlife management concepts.

PURPOSE: The study was designed to collect data on teachers' knowledge of wildlife management supplies.

SUBJECTS: The survey questionnaire was mailed to 526 teachers in 9 schools located in 3 cities. There were 328 respondents with 61.5% being K-8 grade teachers and 38.5% high school teachers. About 57.2% were women. The percentages were very near actual percentages of all teachers in California schools.

RESEARCH DESIGN: The study was descriptive research designed with the help of ten professional wildlife ecologists who acted as judges in the development of the survey questionnaire. The instrument consisted of ten multiple-choice questions dealing with wildlife management. When the questionnaires were sent out, a cover letter and stamped, pre-addressed return envelope were included. A follow-up postcard was sent to all teachers one week after the initial mailing. A second questionnaire and cover letter were sent after seven weeks to the non-respondents. A phone survey was conducted with 30 non-respondents. Statistical tests showed no significant differences between respondents and non-respondents. No reliability measures were reported for the instrument.

RESULTS: Overall, teachers answered an average of 58.2% of the questions correctly. Teachers knew most about the concepts that wildlife populations increase when birth rates exceed death rates (79.8% correct). Questions relating to habitat were handled well also. Teachers did express some confusion about the wildlife stocking program (56.7%) and the introduction of exotic species (44.2%). The least known concept was related to the "edge effect," the fact that wildlife is generally more plentiful near small fields where more types of crops are grown. Only 9.7% of the teachers answered this correctly. Most thought that wildlife was more abundant in dense forests (42%). This misconceptions that surfaced the most in this study were ones relating to the role of wildlife management tools such as hunting, stocking, and exotic species introduction. The recommendation made advised increasing teaching knowledge through in-service training. The study showed only 13.3% of the teachers had ever participated in an environmental training workshop. However, 85% said they would be interested in attending one. Emphasis was placed on the need for environmental educators to be informed with regard to wildlife management concepts.

REFERENCES: 15 cited

094. Horsley, A. (1984). A comparison of American and non-American students' attitudes on issues of the physical environment. The Journal of Environmental Education, 15(3), 37-42.

DESCRIPTORS: Issue awareness/knowledge of issues, secondary, descriptive research, formal, social background, educational background, perceptions/ beliefs, attitudes, personal responsibility, science education

VARIABLES: The variables being measured were environmental awareness, education background, environmental responsibility, and environmental sensitivity.

PURPOSE: The purpose of this study was to compare American and foreign students' attitudes on issues of the physical environment.

SUBJECTS: One thousand twenty-two students participated in the study. Of these, 204 were American (aged 14 to 16 years) and 818 were non-American (aged 15 to 18 years). The non-American students were randomly selected through their schools. They represented 10 countries around the world (Asia, Africa, and Europe). The American students were enrolled in geography classes randomly selected from three locations in the United States (a small town, a large city, and a suburban setting). All the classes of the participants were coeducational except the school in Madras, India, which was an all-girls school.

RESEARCH DESIGN: A descriptive survey design was used. The instrument was in the form of a questionnaire (Likert Scale) and consisted of 40 items. Scores of 5,4,3,2, and 1 were assigned to the continuum of responses (strongly agree-strongly disagree). the instrument was developed by the researcher. Both validity and the reliability of the instrument were discussed.

RESULTS: Scores ranged from 1 to 5 (Likert Scale). The American students' average score was 2.389 while the non-American students' average was 2.237. These scores were significantly different (in favor of the American students) when using the t-test. The alpha level was set at 0.05. The main finding of the study indicated that the American students were relatively more environmentally sensitive than the non-American students. Other findings indicated that neither the American nor the foreign students were willing to agree strongly with the social value statements, i.e., they were unwilling to take responsibility for spoiling the environment or planning for it in the future. The main educational implication of this study was that the contrast between foreign and American schools should be read as a reflection of curricular goals and public/social goals of the sample nations. The non-American societies may be teaching a less environmentally focused curriculum due to the social and/or political values of the society. The researcher did not provide recommendations for further studies.

REFERENCES: 8 cited.

095. Horsley, A. (1988). The unintended effects of a posted sign on littering attitudes and stated intentions. The Journal of Environmental Education, 19(3), 10-14.

DESCRIPTORS: Citizenship action, community resources, affective, experimental research, educational background, attitudes, behaviors

INDEPENDENT VARIABLE: Viewing two anti-signs, enrollment in college-level environmental course.

DEPENDENT VARIABLE: Attitude scores on questionnaire.

PURPOSE: To compare the effects of an anti-littering sign that read "We treat litterbugs like insects" with those for a sign that read "Please save our landscape; don't litter."

SUBJECTS: 245 college students enrolled in a course on the interaction of human beings and the natural environment, and 99 state park visitors.

RESEARCH DESIGN: A quasi-experimental group design was used. Group 1 (n = 147 students) represented the control group and received a seven-item Likert-type questionnaire measuring attitudes toward littering before and after analyzing the two signs. Group 2 (n = 98 students) and Group 3 (n = 99 campers) received the questionnaire only after analyzing the signs. The questionnaire was reviewed by faculty members in environmental fields and piloted among 100 students and other adults. No reliability measurements or validity estimates were given.

RESULTS: T-tests were used to assess differences between the groups. Results indicate that for the most part, students' attitudes were not changed after viewing the signs. The adults felt less strongly than the students about stopping littering in public places. Sixty percent (60%) of the subjects responded that the "save our landscape" sign would stop littering. Sixty-nine percent (69%) perceived the litterbug sign as not changing behavior and 19% believed in would cause people to litter. Decision makers in recreation, planning positions, conservation area planning, and urban park management should keep in mind that signs designed to reduce littering should be carefully worded to avoid negative reactions and ambiguity.

REFERENCES: 30 cited

096. Huber, R. A., Kyle, W. C., Jr., & Pizzini, E. L. (1981). The effect of personal growth and development activities on student attitudes toward social issues. The Journal of Environmental Education, 12(4), 35-39.

DESCRIPTORS: Outdoor Classroom, secondary, affective, experimental research, action learning, outdoor education

INDEPENDENT VARIABLE: Personal growth and development activities.

DEPENDENT VARIABLE: Attitude pertaining to social issues as measured by the Inventory of Social Issues (ISI).

PURPOSE: To determine the effect of personal growth and development activities on students' attitudes toward social issues while participating in a special environmental studies program.

SUBJECTS: The student population for the study consisted of ninety-four (94) students participating in each of four Secondary Student Training Programs (SSTP). Those programs (Rocky Mountain, Yellowstone, Northwoods I and II) involved experiences in laboratory and/or field oriented courses in the sciences. The students within each of the four environmental programs were randomly assigned to a treatment (n=49) or non-treatment (n=45) group at the beginning of the programs.

RESEARCH DESIGN: A post-only control group design was used. Students in both the treatment and non-treatment groups were treated identically throughout the program except for the inclusion of personal growth and development activities in the treatment group. No description of these activities was provided, nor was the length of treatment time specified. The dependent variable was measured at the conclusion of each program by the 60 item Inventory of Social Issues. Seven factor scales of the instrument represent different standards for the definition of the attitude domain in relation to environmental social issues. Validity of the instrument was discussed. Reliability coefficients were not reported.

RESULTS: A simple t-test statistic indicated a significant difference in the mean scores of experimental and control group for all subjects over all settings ($p<.05$). A t-test for unrelated samples was utilized to examine the seven sub-scales of the ISI. On sub-scale 4 (Concern for the problem of increased population and related problems), the experimental group scored significantly higher than the control group. The control group scored significantly higher on sub-scale 3 (The desirability of conservation and preservation of the environment). A t-test for unrelated samples was utilized to examine the difference in mean score for each of the program locations. One program (Northwoods II) showed a significant difference in mean score. The researchers concluded that participation in personal growth and development activities resulted in an advantage in terms of attitudes towards social issues in two of the programs (Northwoods I and II), and failed to do so in the other two programs (Rocky Mountain and Yellowstone). Also, participation in the treatment group affected performance on the different ways, generally positively, but for two of the sub-scales, negatively.

REFERENCES: 31 cited

097. Hutton, R. B., & McNeill, D. L. (1981). The value of incentives in stimulating energy conservation. Journal of Consumer Research, 8(3), 291-298.

DESCRIPTORS: Citizenship action, community resources, program evaluation, experimental research, behaviors, personal responsibility, conservation education, energy education

INDEPENDENT VARIABLES: Prior behavior, fuel source, age, marriage status, education, incentives.

DEPENDENT VARIABLES: Conservation actions taken.

PURPOSE: To determine if incentives increased consumer response to the United States Department of Energy Low Cost/No Cost (LC/NC) Energy Conservation Program.

SUBJECTS: 1,207 New England households as part of the treatment and 604 New York households as a control. Eligible respondents were defined as the male or female head of household. A probability sample of telephone numbers for these regions was developed at two levels: big city and small town or rural.

RESEARCH DESIGN: A posttest only comparison group design telephone questionnaire was used. The six New England states were assigned to the treatment condition. Selected counties from upstate New York were used as a control. Interviews averaged 25 minutes in length and were conducted simultaneously in New England and New York from December 15 to December 28, 1979. A validity check was conducted two weeks later to 180 households selected at random from the original sample and 96% accuracy was reported.

RESULTS: Many New Englanders used the LC/NC conservation measures, shower flow device incentives played a major role in the program, 71% of the New England sample reported reading LC/NC materials and this had a positive result on program effects. The use of incentives and other LC/NC program components resulted in significant behavioral change within two weeks of program cessation. Inexpensive and small-scale conservation measures performed by households can produce significant energy savings.

REFERENCES: 13 cited

098. Iozzi, L. (1989). What research says to the educator. Part one: Environmental education and affective domain. The Journal of Environmental Education, 20(3), 3-9.

DESCRIPTORS: Citizenship action, affective, elementary, middle/junior high school, secondary, synthesis of research, attitudes, outdoor education

VARIABLES: Research results on affective/attitudinal variable.

PURPOSE: To present some of the major ideas about how the affective domain relates to environmental education, based on a cautious analysis of the research conducted over a period of about twenty years.

RESEARCH DESIGN: No information is given as to how studies were chosen for the synthesis.

RESULTS: The author states that most of the research conducted in the area of environmental education and the affective domain has been essentially descriptive, and that very few studies have attempted to determine the effects of specific treatments designed to improve, change, or alter existing environmental attitudes or values. Also, the author notes that many studies lack the necessary rigor to provide the confidence one hopes for in the findings of scholarly research. However, eight major ideas have been identified from this synthesis:

1) environmental education is effective in teaching positive environmental attitudes and values when programs and methods designed specifically to accomplish those objectives are used;
2) the relationship between environmental knowledge and positive environmental attitudes/values is unclear;
3) positive environmental attitudes/values, once acquired, appear to be long lasting;
4) development of environmental attitudes/values should begin before kindergarten and be further developed/reinforced at each grade level through

senior high school;
5) the relationship between environmental attitudes and demographic variables is conflicting and inconclusive;
6) outdoor education is an effective way of improving environmental attitudes/values;
7) various types of teaching methods seem to be effective in improving environmental attitudes/values; and
8) the media are powerful sources for influencing environmental attitudes/values.
Part two of this paper deals with practical implications of the research and gives recommendations.

REFERENCES: 63 cited

099. Iozzi, L. (1989). What research says to the educator, Part two: Environmental education and the affective domain. The Journal of Environmental Education, 20(4), 6-13.

DESCRIPTORS: Values clarification, affective, synthesis of research, multi-disciplinary, values/moral education, ethnic group, issue-based

VARIABLES: Research results on affective/attitudinal variable

PURPOSE: Discussion of the practical implications for the research concerning the affective domain, with recommendations on how environmental education may be infused (with this approach), into other subjects taught in school.

RESEARCH DESIGN: No information given as to how studies were chosen for this synthesis. Recommendations are based on the research presented in part one of this paper.

RESULTS: The following nine recommendations are operationalized to varying degrees in the article:

1) infuse environmental education with a focus on the affective domain into existing curricula at all education levels (pre-K to 12);
2) use values-analysis activities to help them determine how to improve them;
3) environmental problems and issues are largely moral ones, so include activities to help students develop moral maturity as it relates to environmental problem solving/decision making;
4) include outdoor experiences whenever possible, but do not neglect the classroom environment;
5) all children benefit from similar types of environmental education learning experiences regardless of demographic differences;
6) a variety of teaching techniques are useful for teaching environmental education in general and for dealing with the affective domain in particular (inquiry methods that directly involve children in investigating real environmental problems and phenomena seem to be particularly effective);
7) employ television, video tapes, computers, films, audio tapes, and periodicals frequently in the classroom;

8) use many of the low cost and/or free materials/resources available;
9) teachers should become actively involved in environmental activities and with environmental organizations. Additionally, a number of informational resources are provided in the notes section at the end of the paper.

REFERENCES: 15 cited

100. Iwata, O. (1981-82). An examination of a model of anti-pollution behavior. The Journal of Environmental Education, 13(2), 16-19.

DESCRIPTORS: Citizenship action, higher education, affective, model building, descriptive research, formal, knowledge, preferences, attitudes, preferences, behaviors

VARIABLES: Approach to information (AI), Confidence in science and technology (CST), Appreciation of natural beauty (ANB), Awareness of causes of environmental pollution (ACEP), and Insight into consequences of environmental pollution (ICEP) were examined in relation to two anti-pollution behaviors namely, Purchasing (PB) and Coping (CB) behaviors.

PURPOSE: To examine the validity of the Iwata model of anti-pollution behavior which contain the seven variables above.

SUBJECTS: One hundred and eighteen (118) female undergraduates from a Japanese women's university enrolled in two educational psychology classes. Subjects participated in the study as a course requirement.

RESEARCH DESIGN: An Environmental Concern Scale (ECS) was used which consisted of 83 five-point scales: seven for AI, six for CST, seven for ANB, 12 for ACEP, seven for ICEP, eight for PB, and 36 for CB. Each scale had one brief affirmative or negative statement and the subjects were required to check the degree of agreement or disagreement with it in the scale. A total sub-scale score pertaining to each factor was calculated for each individual student. Product-moment correlation coefficients for the seven sub-scales were calculated during assessment of internal consistency (r=0.400-0.630). A six-variable path analysis was carried out using self-reported Purchasing behavior or self-reported Coping behavior as dependent variables.

RESULTS: Approach to information had the most powerful direct influence on both PB and CB (p<.01). Its effect on both behaviors was positive and moderate. Awareness of causes was the second most significant variable but rather weak in its direct effect upon both PB and CB (p<.01). Confidence, appreciation and insight into consequences did not have any significant direct or indirect effect upon either PB or CB but the latter two had significant and positive indirect connections with CB (p<.01). The results also suggested that: (1) Insight into consequences was developed mainly by Awareness of causes and to a smaller extent by Appreciation of natural beauty and (2) Approach to information and to a greater extent Appreciation of natural beauty lead to a greater Awareness of causes. The author suggested a modification of his model to accommodate his findings as well as other antecedents of anti-pollution behavior as mentioned in other studies.

Educational implications and curricular recommendations were given.

REFERENCES: 11 cited

101. Iyengar, S. (1979). Learning about the population problem: Children's attitudes toward family planning in India. Youth and Society, 10(3), 275-295.

DESCRIPTORS: Issue awareness/knowledge of issues, secondary, descriptive research, social background, ethnic background, perceptions/beliefs, preferences, attitudes, population education, religious education

VARIABLES: Awareness of family planning, approval of family planning, class in school, media exposure, place of residence, modernity, partisanship, political information, economic status, religion.

SUBJECTS: A sample of convenience of 863 high school students from the state of Andhra Pradesh in India. Distribution noted as being biased toward urban population and toward males. Twelve percent (12%) of the subjects were Muslim. Age range was from 10 to 18.

RESEARCH DESIGN: Respondents were either interviewed or completed a questionnaire by themselves. Items were open-ended questions regarding subjects' awareness of family planning and attitude toward family planning.

RESULTS: Percentage data were calculated and data were subjected to multiple regression analysis. Seventy percent (70%) of the respondents had heard of family planning. Fourth-nine percent (49%) of the subjects were able to state a reason for family planning and 32% stated a reason which revealed a grasp of the causal relationship between population growth and economic development. Of those who have heard of family planning, 85% believe it is good. Fourteen percent (14%) of the sample preferred large families. Students in the two highest classes had higher levels of awareness of family planning (97% had heard of it) and 56% had a high level of awareness. Fourty-six percent (46%) of the Muslims felt family planning was bad and 42% preferred large families compared to 8% and 12%, respectively, for Hindu subjects. Multiple regression analysis showed that grade level, media exposure, the modernity index, and political information account for 37% of the variance in the awareness index. Modernity, political information, and religion account for 27% of the variance in the index of approval.

REFERENCES: 55 cited

102. Jackson, E. (1985). Environmental attitudes and preferences for energy resource options. The Journal of Environmental Education, 17(1), 23-30.

DESCRIPTORS: Descriptive research, educational background, environmental sensitivity, preferences, attitudes, energy education

VARIABLES: Environmental attitudes were defined according to responses on 31 Likert scale items. Preferences of specific energy resources were collected by use of two questions referring to six options for short-term and long-term use.

PURPOSE: The study utilized responses of a population survey to associate environmental attitudes and preferences of energy resource options.

SUBJECTS: The total sample was 490, but only 446-448 cases were usable due to missing items on the tests. Subjects were undergraduates at the University of Alberta.

RESEARCH DESIGN: The study involved a questionnaire developed by the researcher to measure environmental attitudes along with preferences of long-term and short-term energy resource options. The first two questions asked respondents to choose which of the options (solar energy, coal, energy conservation, oil and natural gas, synthetic fuels, and nuclear power) would help to improve Canada's energy situation in the short-run (next 5 years) and the long-run (beyond the year 2000). Further categorization was made by dividing responses into soft energy paths (conservation & solar energy) and hard energy paths (the remaining options). The attitude scale was used to categorize data into four attitude groups: ecocentrics, technocentrics, and two more moderate groups relative to each extreme. The data was analyzed in respect to the individuals' total score on the 31 statement instrument. The reliability was measured at .81 using SPSS reliability test.

RESULTS: The results show a broad range of relationships between environmental attitudes and preferences for energy-related options. The ecocentric view preferred energy conservation in the short run more frequently than all others (47.6%) while technocentrics preferred coal and nuclear power more frequently (13% for each) than the ecocentrists (5.7% and 1.9%). When comparing soft versus hard paths, the soft energy paths were preferred by over 50% of the ecocentrists and less than one-third of the technocentrists (Chi-square = 14.33 $p < 0.01$). The long-run comparisons were very similar with technocentrists leaning toward hard energy paths and ecocentrists favoring soft paths ($p<0.001$). The shifts in the long-run and short-run preferences were apparent in regard to the conservation and oil/natural gas options. Both options declined in percentage between the short run and the long run analysis ($p<0.0001$).

REFERENCES: 38 cited

103. Jacobs, H. E., Bailey, J. S., & Crews, J. I. (1984). Development and analysis of a community-based resource recovery program. Journal of Applied Behavioral Analysis, 17(2), 127-145.

DESCRIPTORS: Citizenship action, community resources, pre-experimental research, descriptive research, economic background, behaviors

INDEPENDENT VARIABLES: Economic index, weekly recycling schedule, type of media notification, providing of separation containers.

DEPENDENT VARIABLE: Rate of participation in a weekly recycling program.

PURPOSE: Five studies were conducted over a 10-month period to determine the effectiveness of specific procedures in encouraging recycling among residential neighborhoods.

SUBJECTS: Participants were selected from the 6,500 single family dwelling households that participated in the overall Leon County Recycling Program. Each household was informed of the recycling service by a brochure placed on their front door. Within this framework, different neighborhoods were selected in which to conduct the five phases of this study.

RESEARCH DESIGN: Data were maintained on the frequency of recycling by each household over sessions as well as the amount of recyclables collected at each pick-up. A reliability observer was included on 50 of the 131 experimental days. Within the study, neighborhoods were selected in which to collect data related to 5 separate areas: (1) neighborhood participation as a function of economic index; (2) rate of participation as a function of weekly recycling schedule; (3) type of media notification and rates of recycling; (4) facilitating participation through separation containers and multiple prompting procedures; and (5) effects of combined variables.

RESULTS: Results indicated that: a) consistently higher levels of participation were observed in neighborhoods with proportionately higher housing values, b) weekly recycling pick-ups that coincided with garbage collection days resulted in higher levels of participation than pick-ups that occurred at other times, c) notifying homes about the recycling program through distributed door-to-door brochures was more effective than soliciting participation through newspaper adds; d) distributing containers to help residents separate recyclable from non-recyclable material proved to be an effective procedure; and e) procedures that facilitated the greatest levels of participation were not always cost-effective.

REFERENCES: 46 cited

104. James, R. K. & Potts, G. (1982). Assessing environmental education in the public schools. School Science and Mathematics, 81(2), 103-114.

DESCRIPTORS: Elementary, secondary, teacher education inservice, program evaluation, descriptive research, formal, rural, urban, formal, perceptions/beliefs, attitudes

VARIABLES: Goals and present practices in environmental education in Kansas at both district and school levels.

PURPOSE: The purpose of this study was to survey the present practices (status) and goals of environmental education in Kansas. In addition, to then analyze these data for various sub-populations, locations and districts and school levels.

SUBJECTS: Seven (7) groups were used in the sample, (n=1188). A stratified random sample of six (6) of these groups, i.e., school board presidents, superintendents, elementary and secondary principals and elementary and secondary teachers, were made for rural, urban, and metropolitan areas within Kansas. The seventh group was environmental education specialists selected by the researcher (n=18). Of the total number of subjects sent surveys, 81% returned usable instruments (n=957).

RESEARCH DESIGN: Two (2) separate sets of instruments to assess the stated goals and present status of environmental education were developed for this study. One (1) set was to be used at the district level and the other at the school level. Each of the goal instruments contained eighteen (18) Likert-type items which covered the areas of: 1) student performance; (2) local environmental education policy; 3) outside funding; 4) curriculum materials resources and development; 5) community involvement in the development of the local program; 6) determination of goals; and 7) inservice personnel training. The goal instrument statements were validated by a panel of twelve (12) judges for their content validity.

The second set of instruments (present status) were prepared to assess: 1) local environmental education policies and programs; 2) student involvement; and 3) personnel training at the school level. A comparison instrument used with school districts measures: 1) community involvement; 2) environmental education policies; 3) outside assistance; 4) curriculum materials; and 5) personnel training at the district level. The four (4) instruments were sent to the following subgroups: School board presidents - the district level goal instrument; Superintendents - both the district level goal and status measures; elementary and secondary school principals - the school level goal and status instruments; elementary and secondary teachers and the environmental education specialists - the school level goal instrument only. The Spearman-Brown split half correlation coefficient was used to calculate the reliability of the goal instruments at the school level (r = 0.8913) and the district level (r=0.9145).

RESULTS: Analysis of variance and a post hoc analysis on the means for all possibly group comparisons were made using the Scheffe test with alpha = 0.05. A detailed description and discussion of the results were given for each comparison. Three major conclusions were derived from the analysis of the data. They were: 1) metropolitan schools reported more positive attitudes toward the goals of environmental education than did rural or urban schools; 2) the status of current practices in environmental education was not high in any group, but the metropolitan area ranked highest; and 3) the low frequency of items on the status measure showed that little is being done in the area of environmental education.

REFERENCES: 3 cited

105. Jaus, H. (1982). The effect of environmental education instruction on children's attitudes toward the environment. Science Education, 66(5), 689-692.

DESCRIPTORS: Ecology education, elementary, experimental research, directed instruction, knowledge, attitudes

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INDEPENDENT VARIABLE: Environmental education instruction.

DEPENDENT VARIABLE: Student attitudes toward the environment.

PURPOSE: To determine the effects of providing environmental education to elementary/middle school students.

SUBJECTS: 53 students from 2 intact semi-departmentalized 5th grade classes were used as the subjects. The 2 classes are located in different elementary schools but are in the same school district. Students are from a low to middle socio-economic background. The groups were considered to be equivalent

RESEARCH DESIGN: A static group comparison was used for this experiment. The environmental education treatment consisted of 15 lessons given during a 15 day time period, 40 minutes a day. One class received instruction while the control group did not. Following the treatment, students responded to an instrument containing 20 statements on a Likert type scale. Reliability of this measurement was determined by the test- retest method. Twenty three fifth graders not involved in the study were tested and retested nine days later. The Pearson product moment correlation coefficient of .84 was obtained.

RESULTS: Students in the experimental group performed significantly better than students in the control group. The treatment group had a mean score of 89.31 with a standard deviation of 5.36 while the control group had a mean score of 69.52 with a standard deviation of 7.07. The mean score difference of 19.79 produced a t value of 11.45 which is significant beyond the 0.001 level for a nondirectional test with 51 degrees of freedom. When control and experimental groups were reversed results were similar to that of the original experiment with a mean score of 89.11 with a standard deviation of 5.54. The author concluded that through environmental education programs, student attitudes concerning the environment can be changed in a positive fashion.

REFERENCES: 8 cited

106. Jaus, H. (1984). The development and retention of environmental attitudes in elementary school children. The Journal of Environmental Education, 15(3), 33-36.

DESCRIPTORS: Elementary, affective, experimental research, formal, educational background, attitudes

INDEPENDENT VARIABLE: Environmental education instruction.

DEPENDENT VARIABLE: Scores on a questionnaire designed to measure attitudes toward the environment.

PURPOSE: To ascertain the effectiveness of two hours of instruction in environmental education on the development and retention of elementary students' attitudes toward the environment.

SUBJECTS: Two self-contained third grade classes consisting of a total of 49 students, all from lower to middle socio-economic backgrounds. The students were equated by scores on mathematics and verbal achievement tests.

RESEARCH DESIGN: A quasi-experimental pretest-posttest design and a 10-item Likert-type questionnaire were used to measure the children's attitudes toward the environment. One class of 25 students served as the experimental group and received two hours of instruction in environmental education. The other class (n=24) served as the control group and did not receive instruction. The questionnaire was given to both third grade classes and to the same children after two years. A validity test of the questionnaire obtained an r of 0.78.

RESULTS: T-tests were used to statistically analyze the data. Students in the experimental group performed significantly better than students in the control group on the questionnaire given as a posttest to the third graders and also when given to the same students when in the fifth grade. Results indicate that minimal instruction in environmental education is effective in producing positive attitudes toward the environment. These positive attitudes are retained through time. According to the questionnaire scores, students possess slightly positive attitudes toward the environment without formal instruction the subject. Researchers suggest that devoting instructional time to the affective domain of environmental education provides positive attitudinal outcomes.

REFERENCES: 13 cited

107. Jordan, J., Hungerford, H., & Tomera, A. (1986). Effects of two residential environmental workshops on high school students. The Journal of Environmental Education, 18(1), 15-22.

DESCRIPTORS: Issue awareness/knowledge of issues, citizenship action, environmental/nature centers, secondary, experimental research, non-formal, knowledge, behaviors, resource management education

INDEPENDENT VARIABLES: Type of instruction, i.e., instruction at the awareness level, versus instruction at the awareness and action strategies levels.

DEPENDENT VARIABLES: Knowledge of environmental action, and participation in environmental behaviors.

PURPOSE: To investigate in a residential EE program setting, what effect two modes of awareness training (namely issue awareness compared against environmental action awareness) had on high school students knowledge of and willingness to participate in responsible environmental behavior.

SUBJECTS: A total of 62 subjects (high school students) from six outdoor programs participated in the study. The emphasis of the workshops were the Eleven Point River Workshops, Natural Resource Utilization Workshop, Forestry and Wildlife Management Workshop, and Soil and Water Conservation Workshop.

RESEARCH DESIGN: A quasi-experimental modified pretest post-test design was used on all the participants. Three of the 6 outdoor programs groups participated in an issues awareness workshop. The other 3 groups were involved in issue awareness plus environmental action strategy workshops.

RESULTS: Statistical control was accomplished through the use of ANOVA on the two criterion variables, knowledge of environmental action, and self reported environmental behavior. The main findings were:

1. Participants who received instruction in environmental action demonstrated a higher level of knowledge concerning environmental action after instruction.
2. The amount of instruction in each category is directly related to the amount of knowledge gained by students (except consumerism).
3. Subjects' level of environmental action knowledge did not increase after receiving instructional strategy focusing on issue awareness.
4. Participants who received instruction in environmental action reported taking a greater number of environmental actions following the workshop.

REFERENCES: 17 cited

108. Kasulis, J.J., Huettner, D.A., & Dikeman, N.J. (1981). The feasibility of changing electricity consumption patterns. The Journal of Consumer Research, 8(3), 279-290.

DESCRIPTORS: Experimental research, educational background, economic background, behaviors, energy education

INDEPENDENT VARIABLES: Time-of-day energy use rates, group versus individual rates, information feedback.

DEPENDENT VARIABLES: Electricity usage.

PURPOSE: To determine how supply and demand of residential electricity can be synchronized to diminish the difference between peak and off-peak periods.

SUBJECTS: 8,511 electrical customers in Edmond, Oklahoma, stratified by meter route according to number of people and volume of electricity used.

RESEARCH DESIGN: A pretest/posttest control group design was used. All groups were interviewed prior to the treatment and electrical consumption was recorded. The three experimental treatments, administered over a 20 month time period, were: (1) rates and rate structure, (2) group versus individual rates, and (3) information feedback. Following the study participants were reinterviewed. Reliability estimate was not presented. Validity of the posttest interview was checked by calling back 10 percent of respondents.

RESULTS: Data were analyzed using regression analysis and analysis of variance. Alpha level was 0.05. It was concluded that peak and off-peak power are weak substitutes, that information feedback served as a reminder to schedule activities, and that group metering reduced incentives. Implications for energy pricing policy are listed.

REFERENCES: 30 cited

109. Kauffeld, J., & Fortner, R. (1987). Acid deposition coverage in five North American newspapers, 1979-1982. The Journal of Environmental Education, 19(1), 16-24.

DESCRIPTORS: Descriptive research, attitudes, issue-based

VARIABLES: Amount of newspaper coverage given to acid deposition and related causes and solutions.

PURPOSE: To discover the quantity and content of newspaper coverage of acid deposition in five geographic regions of North America from 1979 through 1982.

SUBJECTS: News items about acid deposition from Jan. 1, 1979 to Dec. 31, 1982 found in five newspapers. These included: the Cleveland Plain Dealer, the Burlington Free Press, the Toronto Globe and Mail, the Detroit News, and the Washington Post.

RESEARCH DESIGN: Descriptive, using content analysis.

RESULTS: News items were analyzed using content categories designed by the researchers to gather information relevant to the study. The main findings were:

1. The greatest amount of coverage of acid deposition occurred in two papers, the Cleveland Plain Dealer and the Toronto Globe and Mail.
2. The amount of coverage of acid deposition over the period increased for all papers studied.
3. Human causes of acid deposition were cited more frequently than natural ones.
4. The greatest quantity of news items named the Midwest and the Ohio River Valley as being to blame for the problem.
5. Aquatic impacts of acid deposition were the most frequently mentioned effects in all the newspapers.
6. Of all newspapers, the Washington Post contained the highest percentage of news items suggesting remedies for acid deposition.

REFERENCES: 17 cited

110. Kellert, S. (1985). Attitudes toward animals: Age-related development among children. The Journal of Environmental Education, 16(3), 29-39.

DESCRIPTORS: Elementary, middle/junior high, secondary, descriptive research, environmental sensitivity, perceptions/beliefs, knowledge, attitudes, values, issue-based

VARIABLES: Attitudes, knowledge, behavioral contacts with animals

PURPOSES: To make a preliminary investigation of the attitudes, knowledge and behaviors of school age children (2nd-11th grade) towards animals.

SUBJECTS: The sample was confined to the state of Connecticut, although representative numbers of age,sex, urban/rural, and black/white children were included. The total sample included 63 second, 68 fifth, 67 eighth, and 69 eleventh grade students, a total of 267 children.

RESEARCH DESIGN: The study was a descriptive survey of the knowledge, attitudes and beliefs of school age children with regard to animals. Knowledge was assessed using true/false and multiple choice questions, pictorial identification, questions about food of animals and a film test about ecological relationships. Survey scales were developed to measure each of eight attitudes: naturalistic, ecologistic, humanistic, moralistic, scientistic, utilitarian, dominionistic, and negativistic. Additionally a film and an accompanying questionnaire were created to further assess attitudes toward animals. Methods of surveying behavioral contacts with animals are not given. Validity and reliability are not discussed.

RESULTS: Statistical analyses are used and discussed. Lack of ecological understanding was suggested by responses to the film segment dealing with knowledge. Most children interpreted predation and nutrition cycling anthropomorphically and negatively. Children as a whole, and eleventh graders in particular, were significantly more knowledgeable than adults on questions concerning invertebrates and biological characteristics of animals. Children were relatively able to recognize a variety of species and were also knowledgeable about the primary foods of a variety of species. Highly significant differences were noted among children distinguished by age, ethnicity, and geographic place of residence. The first, second and third most common attitudes respectively were humanistic, naturalistic and negativistic. Some impressive attitude differences occurred among children distinguished by age, sex, ethnicity, and urban/rural residence. Three major transitions were suggested by the results. The period from 2nd to 5th grades was most significantly characterized by increase in emotional concern and affection for animals, that from 5th to 8th grades by improvement in factual and cognitive understanding, and that from 8th to 11th by expansion of ethical and moral concerns. Three quarters or more of the children had participated in the previous two years in seven animal related activities: visiting zoos, owning pets, fishing, learning about animals in school, feeding birds, reading about animals, and watching "Wild Kingdom." It was concluded that educational use should be made of the three major transition periods which were found and that more attention should be given to the animal-related perceptions and interests of urban, disadvantaged children. Activity results indicate the value of programs that emphasize direct contact and experiential involvement with animals.

REFERENCES: 10 cited

111. Keown, D. (1986). Teaching science in U.S. secondary schools: A survey. The Journal of Environmental Education, 18(1), 23-29.

DESCRIPTORS: Outdoor classrooms, environmental/nature centers, community resources, secondary, descriptive research, outdoor education, science education

VARIABLES: Ten research questions were studied concerning frequency of use, impediments to, preparation for, importance of, and administrative support for utilizing outdoor resources in science education.

PURPOSE: To assess the use that is being made of outdoor resources by secondary natural science teachers in U.S. schools.

SUBJECTS: From the 81,142 biology, earth science, and environmental science teachers listed in the National Science Teachers Association, 5000 names were chosen by selecting every sixteenth name on the list. A response rate of 37.02% was achieved. Estimated probability of error was given at +/- 3%.

RESEARCH DESIGN: Questions Were developed by the author utilizing texts, suggestions from a previous survey, associate science teachers, and his own experience. The Likert-type questionnaires were mailed to respondents. Over three months time was allowed for return of the questionnaires with no follow up mailings to non-respondents. No validity or reliability information was given.

RESULTS: Mean scores were used to evaluate and rank responses where applicable. Standard deviation figures are provided for some of the data. Approximately 23% of biology and earth science teachers responding, took their classes outdoors more than four times in a school year. Factors cited as limiting outdoor education included lack of funds, large class size, and conflicting class schedules. When classes were taken outside, it was typically on the school grounds or somewhere within walking distance of the school. Courses and workshops for teachers are called for, to better prepare them for outdoor science education. Greater support from school boards is also seen as a requisite for a broader use of the outdoors in science education.

REFERENCES: 8 cited

112. Kinsey, T.G., & Wheatley, J.H. (1984). The effects of an environmental studies course on the defensibility of environmental attitudes. Journal of Research in Science Teaching, 21(7), 695-83.

DESCRIPTORS: Higher education, cognitive, affective, hypothesis generation, experimental research, educational background, knowledge, attitudes, moral development, issue-based, values/moral education

INDEPENDENT VARIABLE: Type of course in which student was enrolled; level 1 = environmental studies, level 2 = non-environmental studies.

DEPENDENT VARIABLES: Score on the Environmental Issues Attitude Defensibility Inventory (EIADI): 1) measure of value judgment; and 2) measure of defensibility ("total", "count", and "intensity"). One concomitant variable, "blocks" or a false concept, was included to remove the variability due to padding produced by those students who selected all possible responses.

PURPOSE: To evaluate the effect of taking an environmental studies course on the defensibility level of one's value judgment toward environmental issues: Do students utilize information learned in an environmental studies course to support their stated attitudes toward environmental issues?

SUBJECTS: In Phase 1, subjects were students enrolled in two undergraduate environmental studies summer session classes, two undergraduate zoology summer session classes, two graduate environmental studies summer session classes, and two graduate science education summer session classes at the University of Maryland. A total of 141 students were involved in this phase. In Phase 2, subjects were 199 students in two undergraduate environmental studies fall semester classes at State University College at Buffalo.

RESEARCH DESIGN: In Phase 1 of this study a Solomon-Four group design was used. EIADI was administered to a randomly selected 50 percent portion of each class as a pretest. It was administered to whole classes as a posttest. In Phase 2, a pretest/posttest design was used. EIADI was administered at the beginning and end of the fall 1979 semester.

RESULTS: In Phase 1, a two-way Analysis of Variance was conducted on each variable. No significant differences were found among the groups on the pre-test for value judgment or for any of the measures of the level of defensibility, therefore the population was considered homogeneous. Differences between the blocking mean were found to be significant ($p< .032$) for the value judgment variable, therefore, the "low padding" group possessed, on the average, a more pro-environmental value judgment on the issues presented. Analysis of Variance of the posttest scores for the value judgment and "total" and "count" defensibility variables indicated that neither courses nor pretest effects were significant and none of the interactions were significant. The "intensity" defensibility variable was found to have no significance. For the data in phase 2, two-way Analysis of Variance showed no significant differences ($p< .243$) among the section means for the value judgment, therefore, no significant differences existed between the pretest and posttest scores for either group. Significant differences were observed for "total" ($p< .001$), "count" ($p< .001$), and "intensity" ($p < 0.001$) defensibility variables. Therefore, for the subjects in this study, an environmental studies course seemed to have no effect on value judgment, however, it did seem to have an effect on defensibility variables.

REFERENCES: 13 cited

113. Kirk, K., & Karbon, J. (1986). Environmental content in award-winning children's literature: 1960 through 1982. The Journal of Environmental Education, 17(3), 107.

DESCRIPTORS: Environmental sensitivity, ecology education, elementary, affective, descriptive research, values, science education.

VARIABLES: Emotional/psychological dependence, physical dependence, combination (emotional and physical), environmental messages, years of the study, theme groups, story setting, race of main characters.

PURPOSE: To examine whether the new or greater awareness of the environment, initiated by Earth Day 1970, would be reflected in the content of children's fictional literature.

RESEARCH DESIGN: Descriptive research incorporating content analysis to determine the nature and amount of environmental content. Books selected for analysis were winners in at least one of four American awards presented for children's literature. Books were analyzed using the concept that "living things are interdependent with each other and their environment", from Roth (1970), Leopold (1966)), and Chambers and Van Assen (1971). Juxtaposing the individual factor and dependency components was used to examine the books. Inter-coder reliability was established and reported.

RESULTS: The average number of environmental messages for 1959 to 1970 was 10.04, and for 1971 to 1982 it was 11.07 ($p< .10$). Although not statistically significant, the data did show an increase in environmental content in this mid-1970s literature. Environmental content, though present, did not in most cases occur as themes or sub-themes. The highest frequency of environmental messages related to human needs, both physical and emotional. Mainly psychological rather than physical dependence on the environment was projected by urban or small town characters. Many authors depicted natural settings as therapeutic. Results suggest the book's authors retained a traditional view of the environment, i.e., forests, rural settings, Native Americans and farmers in contact with nature, and this contact occurring in isolated areas.

REFERENCES: 16 cited

114. Knopf, Richard C. (1981). Cognitive map formation as a tool for facilitating information transfer in interpretive programming. Journal of Leisure Research, 13(3), 232-242.

DESCRIPTORS: Cognitive learning,program evaluation, ex post facto research, environmental/nature centers, museums, resource management education

INDEPENDENT VARIABLES: Pattern of visitation to interpretive facilities.

DEPENDENT VARIABLES: Perceived clarity of Gettysburg history.

PURPOSE: To determine if early cognitive map formation facilitates information transfer during interpretive experiences.

SUBJECTS: Visitors to Gettysburg National Military Park in 1978 who went to interpretive sites within the park on 14 randomly chosen days during peak period (June, July, August). 38% contacted responded giving a pool of 631. For this study the pool was narrowed to first-time visitors (N =333).

RESEARCH DESIGN: An ex post facto design using a 6 page Likert-type mail questionnaire was utilized to collect information on visitor charactistics, trip motives, park use patterns, problems encountered, attitudes toward park management policies, evaluations of interpretive programs, and perceptions of park setting quality. The data for this analysis (cognitive map formation) comes from the response to part of this questionnaire. No validity or reliability estimates were reported.

RESULTS: Discriminant analysis, standard deviation, estimated strength of association were used to measure statistical differences. Level of significance: $p < 0.01$. The findings indicate that patterns of visitation, which included as a first activity a stop at one of the two sites which allow for cognitive map formation, showed higher levels of perceived clarity among respondents. Those visitation patterns which did not have the cognitive map formation site as a first activity showed lesser levels of clarity among respondents.

Researchers indicated a need for further research to understand visitor response to the whole interpretive environment, how different interpretive devices and messages influence or affect visitor.

REFERENCES: 19 cited

115. Knopf, R. C. (1981). Cognitive map formation as a tool for facilitating information transfer in interpretive programming. Journal of Leisure Research, 13(3), 232-242.

DESCRIPTORS: Environmental/nature centers, museums, cognitive, program evaluation, ex post facto research, resource management education

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REFERENCES: 19 cited

116. Koballa, T.R., Jr. (1984). A validation process for designing one-sided and two-sided communications to use in persuading teachers of the need to teach energy conservation to children. Science Education, 68(2), 91-103.

DESCRIPTORS: Issue awareness/knowledge of issues, issue identification and analysis skills, elementary, teacher education preservice, program development, pre-experimental research, formal, knowledge, attitudes, science education, energy education

INDEPENDENT VARIABLE: One or two-sided communication.

DEPENDENT VARIABLES: Level of developmental advancement within the domain of energy conservation, content of one- and two-sided communications, category importance for preservice teacher education.

PURPOSE: To validate two persuasive communications, one one-sided and the other two-sided. This involves verifying that the one-sided communication has only supportive arguments and the two-sided communication contains both supportive and counter arguments about energy conservation.

SUBJECTS: One hundred thirteen (113) preservice elementary teachers in an eastern university were surveyed to discern what aspects of energy conservation should be included in teacher education. Fifty (50) national energy educators were also surveyed in a second sample to determine what they believed was important to persuade elementary teachers to teach energy conservation. Thirty-six (36) responded. The prepared persuasive communications were given to 45 randomly determined preservice elementary teachers at a large southwestern university (n=21 for Treatment I, one-sided; n=24 for Treatment II, two-sided). They were asked to assess how clearly ideas about energy conservation were expressed in the communications.

RESEARCH DESIGN: A pre-experimental two treatment survey approach was used. Subjects in the first two samples were surveyed to identify important aspects of energy conservation to be included in preservice teacher education courses. The researcher rated the importance of the categories. They were submitted to a panel of three science educators for their ranking. The inter-rater reliability with the results of the first sample averaged .77. The inter-rater reliability of the second sample was .786. The third sample rated the communications prepared with the results from the first two samples. The instrument was a Likert-type scale designed to measure the clarity of the arguments in the communications.

RESULTS: A 2 X 2 Chi-square with Yates correction was calculated for each statement in the survey. A significance difference at the .01 level was reported. Supportive arguments were shown to be present in both types of communications. There was a significant difference between the two communications in the amount of counter arguments. It was recommended that one-sided persuasive arguments be used with preservice elementary teachers who show minimal developmental advancement on energy conservation. Two-sided communications should be used with those showing extensive developmental advancement.

REFERENCES: 16 cited

117. Koballa, T.R., Jr. (1984). Changing attitudes toward energy conservation: The effect of development advancement on the salience of one-sided and two-sided persuasive communications. Journal of Research in Science Teaching, 21(6), 659-67.

DESCRIPTORS: Issue identification and analysis skills, elementary, teacher education preservice, affective, hypothesis generation, experimental research, knowledge, attitudes, science education, energy education

INDEPENDENT VARIABLE: Two levels of communication: 1) one-sided (only favorable arguments regarding issue), and 2) two-sided (both favorable and unfavorable arguments regarding issue).

DEPENDENT VARIABLE: Score on a modified Energy Conservation Attitude Scale.

PURPOSE: To test the effect of two systematically designed persuasive communications on the attitudes toward energy conservation of preservice elementary teachers differing in energy related developmental advancement. Research questions were: 1) Are one-sided and two-sided systematically designed communications more effective in persuading non-developmentally advanced and developmentally advanced persons, respectively? and 2) Do positive attitude gains between pre- and posttests, if any, dissipate within four weeks following the treatment?

SUBJECTS: Pre-service teachers enrolled in several sections of an elementary science methods course at a large southwestern university during the fall semester, 1982. The data sample was n=58. Subjects were stratified according to their score on the "knowledge about energy conservation sub-scale" of the Energy Inventory (BSCS, 1977) and placed into two groups: "non-developmentally advanced"(n=29) and "developmentally advanced" (n=29).

RESEARCH DESIGN: A quasi-experimental, modified pretest-posttest-delayed-posttest design was used. Students from each group were randomly assigned to level of treatment with 28 students receiving one-sided communication and 30 receiving two-sided. Each of the 4 groups received a pre-test 3 weeks prior to treatment. Posttests were immediate and four weeks after treatment. The Likert scale instrument used was a modification of one previously used. Validity and reliability checks for the modified instrument are reported.

RESULTS: Analysis of variance revealed a significant difference between treatment conditions(question 1), F (3,54)=9.27 (p<.01); two-sided communication was more effective regardless of subject's level of developmental advancement when attitude change was measured immediately following treatment. Given this result the investigator proposed two sub-questions: 1) Are persons developmentally advanced with respect to energy conservation more easily persuaded by a one-sided or two-sided communication?; and 2) Are persons non-developmentally advanced with respect to energy conservation more easily persuaded by a one-sided or two-sided communication?. Comparisons between the mean difference scores, pretest-posttest, revealed a significant mean difference between the treatments for developmentally advanced subjects, t(27)=-3.430 (p<0.01). Comparisons between the mean difference scores, pretest-posttest, revealed a significant mean difference between the treatments for non-developmentally advanced subjects, t(27)= -4.354, (p<.01). Therefore, level of developmental advancement in no way mediates the effectiveness of either treatment as measured immediately following exposure. For developmentally and non-developmentally advanced subjects exposed to the two-sided communication, significant mean differences were revealed by the respective analyses (question 2), t(14)=3.29 (p<.01); t(14)=4.11 (p<.01). Therefore positive attitude shifts resulting from two-sided communications dissipated within four weeks. A posteriori analysis did reveal that non-developmentally advanced subjects exhibited a positive shift in their attitudes four weeks after treatment, t(13)=-2.291 (p<.05).

REFERENCES: 30 cited

118. Koballa, T.R., Jr. (1984). Designing a Likert-type scale to assess attitude toward energy conservation: A nine step process. Journal of Research in Science Teaching, 20(7), 709-23.

DESCRIPTORS: Teacher education preservice, teacher education inservice, affective, instrument development, theoretical research, attitudes, energy education

PURPOSE: To develop a Likert-type instrument to measure the attitudes of teachers toward energy conservation and to report the nine step process that was followed in developing the instrument.

RESEARCH DESIGN: A nine step process was used to develop a Likert-type scale aimed at measuring the attitudes of teachers toward energy conservation. Sixty statements were pilotted using a sample of 93 preservice elementary teachers. Validity of the final version of the instrument (19 questions) is reported.

RESULTS: The Attitude Toward Energy Conservation Scale was developed. It is reported to valid and reliable, however, the author encourages continuous monitoring and modification.

REFERENCES: 38 cited

119. Koballa, T.R., Jr. (1986). Changing attitudes toward energy conservation: The effect of self-generated thought on the salience of a two-sided persuasive communication. Science Education, 70(1), 53-60.

DESCRIPTORS: Issue identification and analysis skills, elementary, teacher education preservice, cognitive, experimental research, attitudes, values, conservation education, values/moral education

INDEPENDENT VARIABLE: Method of enhancing the effectiveness of a persuasive communication.

DEPENDENT VARIABLE: Attitude toward energy conservation.

PURPOSE: To test the effect of self-generated thoughts on the salience of a two-sided persuasive communication.

SUBJECTS: Subjects were 58 preservice teachers taking an elementary science methods course at The University of Texas at Austin during the Spring semester of 1983. Complete date were obtained from 49 subjects.

RESEARCH DESIGN: A nonequivalent control group design was used in this study. All subjects watched a videotape of a pro and con persuasive communication dealing with the necessity to conserve energy and to share these concerns with young children. Twenty-eight subjects listed the thoughts that came to mind after watching the videotape and 21 subjects sub-vocally rehearsed the favorable arguments presented in the communication. A 21-item Likert scale was used as a pretest and post-test measure of subjects' attitudes toward energy conservation. Face validity of the scale was established by the author.

RESULTS: Based on Scheffe's test of homogeneity, there was no significant difference (alpha = 0.82) in the variances of the two groups. An analysis of covariance revealed no significant difference between the treatments in changing attitude toward energy conservation. However, the attitudes of the subjects were changed positively, regardless of the treatment.

REFERENCES: 23 cited

120. Koballa, T.R., Jr. (1989). Using salient beliefs in designing a persuasive message about teaching energy conservation practices to children. Science Education, 73(5), 547-567.

DESCRIPTORS: Elementary, teacher education preservice, pre-experimental research, perceptions/beliefs, attitudes, science education, energy education

PURPOSE: The researcher believed that if elementary teachers learn about energy conservation, and view it as favorable, that they will teach conservation practices to their students. It was also believed that the traditional methods of persuasions were not effective in convincing elementary teachers to teach such practices.

SUBJECTS: Twenty-two preservice elementary teachers enrolled in a university science methods course were chosen as subjects.

INDEPENDENT VARIABLE: A message targeted at the subjects, designed to convince them to teach conservation.

DEPENDENT VARIABLE: Desired behavior targeted was teaching environmental conservation one hour per month during the first year of employment as an elementary school teacher.

RESEARCH DESIGN: In this study, information was obtained from the targets about the desired behavior. They were requested to answer a set of questions about the advantages and disadvantages of teaching conservation, and then a set of questions on what groups of people would approve and disapprove of teaching conservation. Seventy-seven (77) statements were obtained, and those were divided into categories by the researcher. The salient beliefs that should be addressed in the persuasive message were then singled out by administering an additional questionnaire to the targets. The message was then designed, reinforcing salient beliefs supportive of the behavior, and attacking non-supportive salient beliefs.

RESULTS: Evidence was then assembled to support the arguments. To validate the message, copies of it were distributed to 14 graduate students enrolled in a science education seminar. They were requested to read the message and indicate on the questionnaire if the arguments were part of the message and if the arguments are supportive of the desired behavior. The data from the questionnaire showed that both were as the researcher designed them to be.

REFERENCES: 16 cited

121. Koballa, T.R., Jr., & Shirgley, R. (1983). Credibility and persuasion: A socio-psychological approach to changing the attitudes toward energy conservation of preservice elementary school science teachers. Journal of Research in Science Teaching, 20(7), 683-696.

DESCRIPTORS: Elementary, teacher education preservice, affective, experimental research, attitudes, issue-based, energy education.

INDEPENDENT VARIABLE: Energy conservation attitude scale.

DEPENDENT VARIABLE: Change in attitudes toward energy conservation.

PURPOSE: To test the effect of two persuasive messages presented by a credible communicator on the energy attitudes of preservice elementary teachers.

SUBJECTS: One homogeneous group of elementary science teachers enrolled in a science methods class. Teachers were assigned a classification of objective personality after taking The Divine Fate Control sub-scale of the Conceptual Systems Test. Three treatment groups were employed: control group (T-1; n=60), conventional communication (T-2; n=60) and integrated communication (T-3; n=60).

RESEARCH DESIGN: An experimental, pretest, posttest, delayed posttest control group design was used. Subjects in the three treatment groups were

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given treatment three weeks after the pretest was given. A posttest was given immediately after the treatment, and again three weeks later. Instruments used were The Energy Conservation Attitude Scale, a Likert-type scale, and The Conceptual Systems Test. Test-retest reliability was determined by three administrations to students and preservice elementary teachers. No reliability coefficient was reported. Validity was determined by subjecting data to a principle component factor analysis. The coefficient alpha for the 22-item scale was 0.85, 0.87 and 0.86 for the three administrations.

RESULTS: Analysis of variance and t-tests were used to measure statistical differences. An alpha level of .01 was selected. Integrated and non-integrated treatments were equally effective and the control treatment was the least effective in changing attitudes immediately and three weeks after the treatment. Abstract thinkers might benefit from integrated treatment and concrete thinkers from non-integrated treatment when pretest and delayed posttest mean scores are compared. The researchers concluded, among other things, that attitude toward energy conservation was changed with as little as a 13-minute communication. The incorporation of the instrument was recommended in other science-related education areas such as nutrition, computers and metrication.

REFERENCES: 20 cited

122. Kochan, W. R. & Allen, R. F. (1981). Adult basic education goals for energy education. The Journal of Environmental Education, 12(4), 40-44.

DESCRIPTORS: Adult/continuing education, program development, model building, descriptive research, energy education

VARIABLES: Competency statements for adult energy education.

PURPOSE: To develop a set of basic energy competencies for adult survival, and a conception of the energy literate/competent adult.

SUBJECTS: Fifty-eight (58) active energy educators in Florida were selected to participate in a 1977 survey project, which was designed to develop competency statements for adults. Geographic distribution and representativeness of energy education settings were considered in making the selections. Of the 58 questionnaires mailed out, 45 (78%) were returned in usable form.

RESEARCH DESIGN: This descriptive research employed a modified Delphi-technique. Fifty-eight (58) Florida energy educators were surveyed via mailed questionnaires. Five-hundred and twenty-one (521) competency statements were generated by the energy educators who responded to the survey questionnaire. Neither the validity nor the reliability of the survey instrument was discussed.

RESULTS: The five hundred twenty-one (521) competency statements were edited, sorted and combined by the project staff and through general interviews with a sample of the respondents. The competencies were classified using a frequency-of-suggestion scale and by level of abstraction. The process resulted in twenty-five (25) competency statements, some with subcomponents. The researchers noted that further refinement of the competency statements would be necessary prior to their use as guides to program development. The researchers concluded that energy education should ultimately yield adults who are active participants in a democratic society and should stress skills and values which help adults confront the conflicts of energy policy issues.

REFERENCES: 5 cited

123. Kuhn, R., & Jackson, E. (1989). Stability of factor structures in the measurement of public environmental attitudes. The Journal of Environmental Education, 20(3), 27-32.

DESCRIPTORS: Environmental sensitivity, instrument development, descriptive research, preferences, attitudes, conservation education

VARIABLES: The dimensions of two environmental attitude scales resulting from factor analysis.

PURPOSE: The purpose of the study was to compare the attitudinal dimensions of two surveys along with the similarities in terms of relationships between scores on the scale and preferences for energy-related options.

SUBJECTS: The two surveys used in the study consisted of one self-administered questionnaire mailing in Edmonton and Calgary. Alberta (1600 mailed, 662 responding) and one similar mailing in the same cities two years later (1,000 mailed, 403 responding). The residents were chosen randomly.

RESEARCH DESIGN: The descriptive research study involved factor analysis of two sets of attitude statements. The first set was from a 1984 study using a "recreation, energy, and environment" survey. The second "energy and the environment" study was done in 1986 with the dame population. The attitude scale in both studies was a 21-item instrument developed by combining and modifying the "new environmental paradigm" and "dominant social paradigm" scales used by Dunlap and Van Liere. Respondents were also asked to evaluate a set of future energy options that could be pursued in Canada.

RESULTS: The factor analysis of the first survey resulted in four factors which explained 44.4% of the total variance. Crohnbach's alpha coefficient was used to determine an alpha score of 0.82 for the whole scale. The second survey also had four factors with 49.6% of the total variance accounted for. The alpha score was 0.04 for the entire scale. The conclusions of the analysis were that the environmental attitudes measured in the two surveys were multidimensional with four distinct factors emerging: 1) negative consequences of growth and technology, 2) relationships between mankind and nature, 3) quality of life, and) limits to the biosphere. In examining the energy option preference results, four groups of respondents were categorized according to environmental attitudes while three categories of energy resource preferences were used. Results were very similar to a previous study (Jackson

1985) with significant trends in comparing attitudes and preferences. Both surveys showed similar trends (p<.0001 and p< .01 respectively). The researchers concluded the 21 item scale seemed useful for future research in similar comparative studies.

REFERENCES: 11 cited

124. Labay, D. G., & Kinnear, T. C. (1981). Exploring the consumer decision process in the adoption of solar energy systems. The Journal of Consumer Research, 8(3), 271-278.

DESCRIPTORS: Citizenship action, model building, descriptive research, educational background, social background, beliefs, behaviors

INDEPENDENT VARIABLES: Adoption/non-adoption of solar energy systems.

DEPENDENT VARIABLES: Demographic variables; perceptions of characteristics of solar energy systems; economic, social, and product-related factors considered in evaluation; date of adoption.

PURPOSE: To test for differences between adopters and non-adopters of solar energy systems with regard to demographic and attribute variables.

SUBJECTS: 631 residents of Maine. 170 had adopted solar energy systems, 232 were knowledgeable non-adopters, and 229 comprised the control group. Response rates were, respectively: 69%, 76%, and 48%. The control group was randomly selected; adopters and non-adopters were samples of convenience.

RESEARCH DESIGN: In this descriptive study, a mail survey was used to collect data. Respondents' perceptions of seven characteristics of solar-energy systems were measured using Likert-type items. Importance of factors considered in purchase of solar energy systems was measured using Likert-type items. Time of adoption and demographic data were collected using open-ended items. Validity and reliability estimates were not provided.

RESULTS: Various bivariate and multivariate analyses were used to analyze the data. Alpha level was 0.05. It was concluded that there were numerous differences between adopters and non-adopters on many of the demographic and attribute measures. It was also concluded that attribute perception data offer greater classification ability than demographic data. Research recommendations were provided.

REFERENCES: 16 cited

125. Langeneau, E.E., Jr., Peyton, R.B., Wickham, J.M., Caveney, E.W., & Johnson, D.W. (1984). Attitudes toward oil and gas development among forest recreationists. Journal of Leisure Research, 16(2), 161-177.

DESCRIPTORS: Issue awareness/knowledge of issues, perceptions/beliefs, attitudes, values, resource management education, energy education

INDEPENDENT VARIABLES: Natural resources issues and public attitudes.

DEPENDENT VARIABLES: Attitudes, beliefs, and values toward oil and gas development, environmental sensitivity, perceived development of natural resources.

PURPOSE: To extend the research on attitudes toward oil and gas development by applying an integrative model, to discuss the generalizability of this model for understanding public attitudes toward economic development of other natural resources, and to speculate on the policy implications of results for land management programs.

SUBJECTS: A sample of recreationists visiting the Pigeon River Country State Forest between March 1, 1981 and February 28, 1982. Individuals cutting firewood for noncommercial use were also included in this study.

RESEARCH DESIGN: 1,569 postcards were left with vehicle occupants or on windshields during 152 sample days between March 1, 1981 and February 28, 1982. These postcards requested names and addresses of everyone in the vehicles. A sample of 569 vehicles were then selected for the mail questionnaire.

The mail questionnaire was sent out in two sets: visitors who came between March 1, 1981 and August 31, 1981 and those who came between September 1, 1981 and February 28, 1982. Two follow-up forms were mailed to those who did not respond. Questionnaire items included visitor characteristics, recreational behavior, values, beliefs, and attitudes. Sample size of 1,231 was determined from the 596 vehicles. It was not possible to contact people from 29 of these vehicles. Nine hundred thirty one (931, 76%) usable questionnaires were returned. About 76% of the respondents were male while 24% were female and the average age was 37. People drove an average of 351 miles to and from the forest.

RESULTS: The majority of respondents were not in favor of development. Attitudes toward oil and gas development were related to age of the visitor. Older respondents showed more approval of the development. The relationship between age and attitude was significant when controlled by years of experience in visiting the forest. Also, increased recreational participation was associated with disapproval of development.

Concerning visitors' values, approval of oil and gas development was related to a generalized value that natural resources should be used for economic development. Belief items were significantly related to attitudes toward development. Most notable was the differences in beliefs about the impact of development on elk. A multiple regression of these variables showed that the influence of measured beliefs on levels of opposition to development was greater than the influence of measured value priorities.

It was concluded that information and education would not change the attitudes of visitors with strong preservationist values. It is thought that even if values were clarified and prioritized, many visitors would still oppose the oil and gas development at PRCSF. On the other hand, working with visitors beliefs such as exposing them to information about the increase in the number of elk might reduce some of the opposition.

REFERENCES: 23 cited

126. Larson, M.A., Forrest, M. & Bostian, L. (1981). Participation in pro-environmental behavior. *The Journal of Environmental Education*, *12*(3), 21-24.

DESCRIPTORS: Citizenship action, descriptive research, knowledge, behaviors

VARIABLES: Participation in political environmental activism, and participation in household environmental activities.

PURPOSE: To collect data on environmental activism (i.e., first study: household and political; second study: political only) in an attempt to discover how universal was participation in pro-environmental behavior across the general population. A methodological goal of this research was to investigate the variety and range of pro-environmental behavior using large, random samples of the general population.

SUBJECTS: The first survey utilized a random sample of 230 residents of Madison, Wisconsin. The second survey used a stratified, random statewide sample of 544 non-institutionalized adults of Wisconsin. A total of 207 environmental activists in Wisconsin served as a known group comparison for the sample of the second survey.

RESEARCH DESIGN: A first-class mail questionnaire was used to college date for the first study. Out of 400 persons selected from the city directory, 230 responded (57.5%). The questionnaire contained nine (9) items on the level of participation in political environmental activism (e.g., letter writing, petition signing) and twenty-two (22) items on the levels of participation in household environmental activism (e.g., non-lead gas use, recycle cans). The respondents were asked to check in which items they have engaged. Percentages were then computed. The second survey used five environmental-activism questionnaire items which were similar to those used in the first survey. These questionnaires were given to both the statewide sample and the known group comparison of environmental activists. Reliability and validity coefficients were not reported for either instrument.

RESULTS: The first survey showed that one-third to one-fourth of the respondents engaged in some form of political or household activism. It was further reported that most persons who engaged in one of the political participation variables were not active in their households. The second survey showed that at least one-third of the political activism reported in the statewide random sample and the Madison select group of environmental activists showed significant difference in several items as listed between the two groups ($p<.05$, according to an F test), in favor of the latter. The authors concluded that a fairly large fraction of the general population of Wisconsin was engaged in pro-environmental behavior. Several recommendations were made.

REFERENCES: 9 cited

127. Larson, M. A., Zimmerman, D., & Scherer, C. (1982). Communication behavior by environmental activists compared to non-active persons. The Journal of Environmental Education, 14(1), 11-20.

DESCRIPTORS: Issue awareness/knowledge of issues, issue investigation and evaluation skills, citizenship action, hypothesis generation, descriptive research, educational background, economic background

VARIABLES: Media usage patterns, environmental activists and non-active individuals, educational background, economic background.

PURPOSE: To determine whether persons who are environmentally active use the mass media differently than those who are not environmentally active. Ten specific hypotheses are listed and tested in relation to the purpose-stated above.

SUBJECTS: A statewide random sample of 336 Wisconsin adults, divided into two categories: environmental activists and non-activists. In addition a "known group" select sample of environmental activists was developed for 208 persons belonging to specific environmental organizations in the Madison area. Of these 208 persons, results of a questionnaire administered to them indicated that only 164 of the respondents fit the author's definition of an environmental activist. The same operational definition was employed to categorize the 336 adults. Three hundred and four (304) fell into the non-activist category and 32 fell into the activist category.

RESEARCH DESIGN: In this descriptive study personal interviews were conducted with all subjects in both the random and select samples by the Survey Research Laboratory at the University of Wisconsin, Madison. Media use variables were investigated via specific interview questions concerning the average amount of environmental issues, most important source of environmental information, and degree to which further information is sought concerning environmental issues.

RESULTS: Analysis of Variance showed no significant difference between non-activists and activists in the random sample on eight specific mass media use variables. A significant difference was found to exist between the two groups on "extent to which you want to find out more about environmental problems" (p.02) in favor of the environmental activists. The authors discuss information contained in tables showing the percent of respondents in each category (random activists, random non-activists, and select activists) reported reading specific magazines, the most important source of information, and the most influential source of information for each group of respondents.

Overall, the general assumption about differences between environmental activists and non-active persons in mass-media use are not supported. The authors caution that it may be unwise to generalize from select samples of environmental activists to activists found in the general population. The randomly chosen activists and the select sample activists differed on a number of key demographic factors. Further research is needed to determine what media content environmental activists prefer and why and to determine the role of mass media in determining which environmental issues are considered important for the environmental activists and for non-active persons.

REFERENCES: 22 cited

128. Lawrenz, F. (1983). Factor validation of Kuhn's Energy Opinionnaire. The Journal of Environmental Education, 15(2), 42-44.

DESCRIPTORS: Secondary, teacher education inservice, affective, instrument development, program development, program evaluation, descriptive research, energy education

VARIABLES: Analyses relating to the consistency of Kuhn's Energy Opinionnaire.

PURPOSE: The study consisted of a report on the consistency of David Kuhn's 2 factor, 25 item Energy Opinionnaire. It was designed to add information to the opinionnaire's existing analysis with factor analyses based on two additional populations.

SUBJECTS: One population consisted of randomly selected 10-12 graders and a random sample of elementary through high school teachers, both from Arizona. The second population was participants in the Arizona Portal School Program (teachers) and their high school students. This sample was compared to the random sample and the two were pooled together since no major differences were found. The total sample consisted of 245 high school students (approximately equal number of boys and girls) and 547 teachers (mostly females).

RESEARCH DESIGN: The responses of the opinionnaire were subjected to factor analyses using the Statistical Analysis System while reliabilities were determined with Cronbach Alpha procedures. The criteria applied: A) one factor had to account for at least 2% of the variability; B) one factor had to have a eigenvalue of at least 2.0; and C) one factor had to have five items which met the following criteria. The criteria were: 1) an item must have a minimum factor loading of 2.9; and 2) an item had to account for at least 50% more of the variance in the factor which it was selected than in any other interpreted factor.

RESULTS: The results of the high-school data analysis did lend some support to the opinionnaire's two-scaled structure. While only two factors have eigenvalues above 2, the items loading on these factors were the same ones found by Kuhn. Kuhn's suggested structure was not fully supported since six of the original items did not meet criteria. The teacher data analysis did not match Kuhn's. With the same two factors having eigenvalues above 2, the items were not arranged in he same fashion. The directions of the item loadings were not consistent with the other data sets for two of the items retained on the first factor and for one retained on the second factor. The research gives support to Kuhn's two-scale opinionnaire as it is used with high school students. Suggestions are made concerning particular items and low reliability of Scale One. The opinionnaire did not seem to be reliable in its use with teachers.

REFERENCES: 6 cited

129. Lawrenz, F. (1983). Student knowledge of energy issues. School Science and Mathematics, 83(7), 587-595.

DESCRIPTORS: Issue awareness/knowledge of issues, elementary, middle/junior high, secondary, descriptive research, formal, knowledge, energy education

VARIABLES: Knowledge of energy issues.

PURPOSE: To obtain information on the status of student knowledge of energy issues in order to identify areas where increased teaching emphasis is needed.

SUBJECTS: Two sets of students were surveyed. The first set was taken from a random sample of 100 schools selected from the Arizona Educational Directory from which 56% indicated an interest in participating in the survey. In the second set, a non-random sample of fourth grade, seventh grade, and high school (grades 10-12) teachers were contacted and asked to administer an energy knowledge instrument to their students. The final sample consisted of 609 fourth graders, 618 seventh graders, and 219 high school students.

RESEARCH DESIGN: Items on energy education topics from the National Assessment of Educational Progress' 1978 assessment of young adults were modified to construct an Energy Survey for use with the subjects in this study. Kuder-Richardson reliabilities were .27 for the fourth grade version of the survey and .31 for the high school version. The energy survey was administered to the subjects described above. The percent of students selecting the correct response was determined. Gender comparison t-tests for each grade level were also calculated on the mean scores of the Energy Survey.

RESULTS: Any items answered incorrectly by more than 50% of the students was considered to represent an area of deficiency. On six of the items, the seventh graders earned higher scores than did the other two groups. On four items, the fourth graders received the highest scores. Deficiencies were revealed in the student knowledge of availability and use of coal and oil, about the validity of alternate power sources, about the nature of energy, and about practical considerations in power generation. The mean scores for the boys were consistently higher than were the scores for the girls.

REFERENCES: 17 cited

130. Lawrenz, F. (1985). Impact on a five week energy education program on teacher beliefs and attitudes. School Science and Mathematics, 85(1), 27-36.

DESCRIPTORS: Teacher education inservice, program evaluation, pre-experimental research, formal, perceptions/beliefs, attitudes, issue-based, energy education

INDEPENDENT VARIABLE: Attendance at energy education workshops.

DEPENDENT VARIABLE: Attitude toward energy issues, attitude toward curricular change, attitude toward science education.

PURPOSE: To assess the effectiveness of a five-week energy education program.

SUBJECTS: One hundred thirty-two teachers in the Phoenix metropolitan area, none of whom had previously participated in energy education programs. All subjects self-selected into attendance at the workshops.

RESEARCH DESIGN: Inservice training in energy education consisted of selection of master teachers from local districts to attend intensive training sessions, then, in turn, these teachers transmit this information to their colleagues through classes offered in their local districts. The inservice was designed to encourage the implementation of a previously prepared packet of energy education activities for grades K-8. Three types of attitudes were measured before and after the program: attitude toward curricular change, attitude toward energy issues, and attitude toward science education.

RESULTS: Pre-post, paired t-test results and mean scores were determined for the total and scale scores. An examination of the mean scores on the energy opinionnaire revealed that the program was successful in modifying teacher attitudes toward energy. The Beliefs about Science and Science Education instrument revealed that the teachers became more aware of how energy is wasted and that the classes were most successful in modifying teachers' beliefs about science teaching toward a non-directive, student-centered approach. No significant changes were found on the Energy Conservation and Development scale, although improved attitudes toward conservation were noted for some items. In short, these inservice classes appear to have had a modest, positive effect on the participants which should help to promote energy education.

REFERENCES: 12 cited

131. Lawrenz, F. (1986). Energy education: Resources, use, and promotion. The Journal of Environmental Education, 17(4), 23-26.

DESCRIPTORS: Teacher education inservice, descriptive research, formal, energy education

VARIABLES: Classroom teachers, resource teachers, different teaching levels.

PURPOSE: To describe what energy education resources are available to resource center and classroom teachers and to document their use, to determine what type of teachers implement energy education and why and how they do so, to determine the most commonly used energy education materials, and to ascertain what the teachers felt would be the best way to promote energy education.

SUBJECTS: A random sample of 288 schools was selected from the 1983 Arizona Educational Directory. Questionnaires were sent to the principal of each school, requesting that he/she distribute the questionnaires to the resource teacher and two randomly-selected classroom teachers. A reminder letter was sent three weeks after the initial mailing. There were 146 responses (42%) from classroom teachers and 93 responses (32%) from resource teachers.

RESEARCH DESIGN: Two questionnaires were developed, one for the resource teachers and one for the classroom teachers. The items on both questionnaires were designed to focus on the variables contained in the purpose statement. No information on the validity or reliability was provided by the author.

RESULTS: Percentages were reported and chi-square analyses were utilized on some of the data. A composite view of the teacher most likely to be teaching energy education would be a sixth-grade, male science teacher in a departmentalized setting. Resource centers appear to be capable of providing energy education materials, but have a problem in making teachers aware of the materials. The author concluded that: 1) energy education is not provided in a consistent manner; 2) no strong trends or favorite materials emerged; 3) those who use energy education know of available materials and consider it part of their curricular responsibility; 4) those who do not use energy education feel that materials are not available and that their other curricular responsibilities preclude energy education. Recommendations for future efforts are included.

REFERENCES: 4 cited

132. Lawrenz, F. (1986). Teacher to student transfer in energy education. School Science and Mathematics, 86(1), 1-9.

DESCRIPTORS: Issue awareness/knowledge of issues, elementary, middle/junior high, secondary, teacher education inservice, affective, descriptive research, attitudes, energy education

VARIABLES: Knowledge of energy, attitude toward energy conservation, attendance at energy inservice classes.

PURPOSE: To investigate the correlation between teachers' and instruments and to investigate the extent of teacher to student transfer of attitudes.

SUBJECTS: Part I: A random sample of teachers and students from throughout Arizona was selected to provide data to determine the correlation between teacher and student attitudes toward energy and their knowledge of energy. Subjects consisted of 35 classes; 10 fourth grades, 16 seventh grades and 9 high school classes. Part II: The sample consisted of 30 fourth and seventh grade teachers randomly chosen from a group of 280 teachers enrolled in 14 energy education classes.

RESEARCH DESIGN: Part I: Both the selected teachers and their students completed an energy opinionnaire and an energy knowledge instrument. The class scores were correlated with the teachers' scores. Part II: The 30 selected teachers were asked to administer an energy opinionnaire to their fourth and seventh grade students at the beginning and end of the school year. The 30 teachers also completed the energy opinionnaire before and after their inservice training and again at the end of the school year. Data were analyzed to determine change in attitude of the teachers throughout the period of the study. To determine if teachers attitudes were transferred to their students, results for the individually paired t-tests and the mean scores and standard deviations for the fourth and seventh graders on the two scales were analyzed.

RESULTS: Based on the data collected and analyzed in this study, it seems that the hoped for transfer of teacher attitudes toward energy to their students may not take place. Results from Part I showed that teacher attitudes were not strongly related to their students' and many of the correlations, including the only two significant ones, were negative. Even though the teachers' attitudes were improved through participation in the inservice training classes, their students attitudes showed no such change, and may even have moved in the opposite direction. Part II: Analysis of pre- to post-test scores on the energy opinionnaire showed significant growth in the positive direction on both the opinionnaire scales. This increase in attitude was not shown to be transferred to the students.

REFERENCES: 11 cited

133. Lawrenz, F. (1988). Prediction of student energy knowledge and attitudes. School Science and Mathematics, 88(7), 543-549.

DESCRIPTORS: Issue awareness/knowledge of issues, elementary, middle/junior high, descriptive research, perceptions/beliefs, knowledge, attitudes, energy education

INDEPENDENT VARIABLE: Perceptions of classroom psychosocial environments.

DEPENDENT VARIABLE: Knowledge of energy concepts and attitude toward energy.

PURPOSE: To determine if students' perceptions of their classroom psychosocial environments are related to their knowledge of energy concepts and their attitudes toward energy, and, if so, to describe the type of environment likely to be associated with favorable outcomes.

SUBJECTS: Thirteen fourth grade classes and 21 seventh grade classes, approximately 1,000 students were chosen from a random sample of public schools in Arizona who had agreed to take part in the survey.

RESEARCH DESIGN: Students completed three instruments: the Energy Survey (ES), the Energy Opinionnaire (EO), and the My Class Inventory (MCI). Kuder-Richardson reliability of the ES for these students was low (r=.27). For the

EO scale, Cronbach alphas of .53 for the Conservation scale and .52 for the Public scale were reported. Cronbach alpha's ranged from .73 to .88 for the 5 sub-scales of the MCI instrument. All instruments were administered to subjects during early spring. Class means were used as the basis for analysis.

RESULTS: The data were analyzed using Goodnight's maximum R2 improvement technique. The scales were found to predict energy knowledge for fourth and seventh graders, and attitudes toward energy conservation for seventh graders better than the other scores. The classroom psychosocial learning environment scales predicted from 17% to 59% of the variance in student knowledge and attitude scores.

REFERENCES: 18 cited

134. Lawrenz, F., & Dantchik, A. (1985). Attitudes toward energy among students in grades 4, 7 and high school. School Science and Mathematics, 85(3), 189-202.

DESCRIPTORS: Elementary, middle/junior high, secondary, hypothesis generation, descriptive research, formal, attitudes, locus of control/efficacy, issue-based, energy education

INDEPENDENT VARIABLE: Grade level, gender.

DEPENDENT VARIABLE: Attitude toward energy.

PURPOSE: To investigate the possibility of development and/or gender components to energy attitude formation by assessing the attitudes toward energy of fourth grade, seventh grade and high school students.

SUBJECTS: Subjects were 123 boys and 117 girls in 4th, 7th, or high school from 22 different Arizona schools. Subjects were chosen from a random sample of schools in the randomly selected schools were asked to select a 4th, 7th or high school teacher to participate in the study. These teachers, in turn, selected one of his/her classes to provide the requested information.

RESEARCH DESIGN: Subjects were administered an energy opinionnaire containing three sub-scales. Reliability values for these sub-scales were reported both from the original research and for the students in each grade level sampled.

RESULTS: Comparisons were made among students from each grade level using t-test and Spearman rank order correlations. T-test comparisons were then made between males and females at each grade level. The data supported the hypothesis that attitudes toward energy have a developmental component. The students' attitudes toward energy issues were different at the three grade levels. It appears that the attitudes toward energy reflect the transition from an internal focus to an external one. The data gave some support to the hypothesis that gender differences exist and that they become more pronounced as students get older. Females in their later teens appear to have a more external world view than do males.

REFERENCES: 31 cited

135. Lee, M. Y. (1981). Federal and State assistance expectations among local policymakers. The Journal of Environmental Education, 12(4), 9-13.

DESCRIPTORS: Hypothesis generation, descriptive research, rural, urban, perceptions/beliefs, attitudes, resource management education, conservation education

VARIABLES: Expectation of future assistance; seriousness of water shortage; residency; status of policymaker.

PURPOSE: To determine the expectations of local water policymakers regarding state and federal assistance on future water resource management.

SUBJECTS: Fifty-six (56) water policymakers from twelve (12) Iowa communities which had suffered severe water shortages due to drought in 1977. Included among the policymakers were mayors, council persons, water board members, water works (or utility works) directors, and other officials, all of whom were still active in official capacities at the time of data collection (Summer, 1978). The policymakers were categorized according to the size of the community in which they were employed (rural/urban), according to the seriousness of the water shortage in their communities (determined by the adoption of voluntary/mandatory conservation), and according to their status (appointed/elected).

RESEARCH DESIGN: This descriptive study employed an interview technique to determine assistance expectations. Two open-ended questions were posed. Responses were grouped into four (4) categories of future state and federal assistance: 1) technical assistance, 2) financial assistance, 3) nothing in particular, and 4) "Stay away from me." Validity or reliability information were not reported.

RESULTS: A calculation of simple frequencies of responses indicated that there was more financial dependency upon the federal government than upon the state government, while more technical dependency rested on the state government than the Federal Government. Using a chi-square statistic and a Kendall's tau b ($p<.05$), the researchers found that expectations of future federal assistance was more prevalent than expectations of no future federal assistance. With regard to state assistance, there was no significant difference between expectations of future assistance and no expectations. Additionally, there was no significant evidence to support the view that federal assistance was favored over state assistance overall. For both federal and state assistance, higher proportions of policymakers who had adopted mandatory conservation policies expressed expectation of future assistance than those who had adopted voluntary policies. There was no significant relationship between expectations and residency. Areas for future research were recommended.

REFERENCES: 9 cited

136. Leonard-Barton, D. (1981). Voluntary simplicity lifestyles and energy conservation. The Journal of Consumer Research, 8(3), 243-252.

DESCRIPTORS: Citizenship action, instrument development, educational background, social background, ethnic background, economic background, environmental sensitivity, behaviors, energy education

INDEPENDENT VARIABLES: Income, education, age, race.

DEPENDENT VARIABLES: Voluntary simplicity factors - conservation through biking, self-sufficiency in services, recycling resources, recycling goods, self-sufficiency in goods, closeness to nature.

PURPOSE: To design a measure of voluntary simplicity behavior, especially in relation to energy conservation. To determine the socio-demographic characteristics of people who score high on the index. To test the index as a predictor of energy-conserving behaviors and of the purchase of energy-conserving technologies.

SUBJECTS: California homeowners

RESEARCH DESIGN: Instrument development and descriptive survey were used. Factor analysis and multiple regression were used to develop the Voluntary Simplicity Index based upon 4 other simplicity scales which had been used in California. The need to do a complete validity check was reported, but only a partial check was done.

RESULTS: The Voluntary Simplicity Index was not linearly related to income ($r=0.10$; $p<.16$). The relationship was very slightly curvilinear. Middle income families (16,000 to 35,000) scored higher than lower or higher income families. Index is related to education ($r=0.16$; $p<.001$). As a whole, the Voluntary Simplicity Index is negatively related to age. There appears to be no strong predictive relationship between race and voluntary simplicity. Researchers identified possible motives for and against simplistic behaviors. The relationship between simplicity and energy use was explored. Implications and areas of further research were identified.

REFERENCES: 23 cited

137. Lewis, G.E. (1981-82). A review of classroom methodologies for environmental education. The Journal of Environmental Education, 13(2), 12-15.

DESCRIPTORS: Teacher education preservice, teacher education inservice, program evaluation, synthesis of research, formal, games, simulations, knowledge, attitudes, behaviors, outdoor education

VARIABLES: Various classroom methodologies for environmental education and their effects on environmental attitudes, environmental behaviors, and ecological knowledge.

PURPOSE: To review empirical classroom methodological studies, included in the last ten years of The Journal of Environmental Education (JEE), from 1970 to 1980, in order to: (1) provide a foundation for curriculum planning; and (2) evaluate the quality of the research and make recommendation for improvement.

SUBJECTS: Seven (7) identified EE studies which measured the effects of various EE instructional strategies on students. The strategies were: gaming and simulation, indoor vs. outdoor instruction, field trips to a nature center, a modified science methods course, teacher in-service workshops to prepare instructional activities, and two resident camp programs.

RESEARCH DESIGN: Using the JEE (1970-1980) as the source of research articles on instructional strategies, the reviewer used the following criterion for including a study in the review: the article must actually use the instructional EE strategy with students. Excluded from the review were statements of philosophy, attitude studies and articles discussing environmental problems. After identifying seven (7) such articles, the researcher subjected each study to an evaluation of the quality of the research. The findings of all the studies were also summarized. No a priori criteria for evaluation were stated by the researcher.

RESULTS: The reviewer concluded that not all of the studies took care to report critical data which would allow the reader to evaluate the validity of the study; that the studies which were reported are lacking in methodological rigor and that the validity of the results is questionable. Minimum research criteria and specific recommendations are presented. The researcher further concluded that of the studies reviewed, the use of a combined indoor/outdoor strategy, teacher inservice, and attendance at some form of nature camps appeared to hold the most promise for environmental methodologies in formal classroom settings. Complete bibliographic information of the seven studies reviewed are given.

REFERENCES: 7 cited

138. Lien, V. (1981). Teachers, not materials, determine ultimate use of innovations in marine education. CURRENT/The Journal of Marine Education, 2(3), 8-9.

DESCRIPTORS: Teacher education inservice, hypothesis generation, descriptive research, attitudes, verbal commitment/intention, marine education

VARIABLES: Teachers' willingness to use innovations.

PURPOSE: To determine factors which affect a teacher's willingness to use innovations.

SUBJECTS: Subjects were 332 teachers who participated in one of 13 marine education workshops. No details were given regarding teacher demographics.

RESEARCH DESIGN: Surveys were used to gather data from the subjects. The surveys included demographic data, classroom activities, personal perspectives, education innovations, and marine education innovations. The marine innovations were six activities selected from a curriculum unit, Investigating the Marine Environment and Its Resources. Teachers were asked to indicate their degree of willingness to use each of the six activities. No details were given regarding survey construction, validity and reliability, or type of analysis.

RESULTS: The best indicators of willingness to innovate were the teacher's personal attitudes toward teaching, change-agent, and role. Teachers who use other innovations are more receptive to marine education innovations. The innovation itself may determine both teacher attitude and teacher willingness to use the innovation.

REFERENCES: 7 cited

139. Lowe, G.D., & Pinhey, T.K. (1982). Rural-urban differences in support for environmental protection. *Rural Sociology*, *47*(1), 114-128.

DESCRIPTORS: Citizenship action, hypothesis generation, secondary analysis, educational background, economic background, rural, urban, attitudes

INDEPENDENT VARIABLES: 22 demographic variables.

DEPENDENT VARIABLES: Attitude toward spending money on "improving and protecting the environment".

PURPOSE: To examine theories which show positive correlation between urban residence and public support for environmental protection. Eight hypotheses were tested.

SUBJECTS: A sample of convenience of 9,038 individuals previously surveyed in the 1973 - 1978 General Social Surveys conducted by the National Opinion Research Center.

RESEARCH DESIGN: The original data in this study were collected using questionnaires, including Likert-type items and categorical items. Validity and reliability data were not reported.

RESULTS: Regression analysis, analysis of variance, and analysis of covariance were used to analyze data. Alpha level was set at 0.05. It was found that the urban sample held a higher level of support for environmental protection than the rural sample ($r = 0.109$; $B = 0.052$). The only other variables found to have relatively large independent effects on environmental support were fiscal conservatism ($B = -0.25$) and age ($B = -0.18$). Other statistically significant predictors were: education ($B = 0.04$), political party ($B = -0.04$), environmental region ($B = 0.04$), and year of survey ($B = -0.065$). Total variance accounted for was 15.4 percent. Conclusions were given for each of the eight hypotheses tested. It was suggested that the study eliminated some explanations of the differences between urban and rural support for environmental protection.

REFERENCES: 22 cited

140. Luyben, P. D. (1982). Prompting thermostat setting behavior: Public response to a Presidential appeal for conservation. Environment and Behavior, 14(1), 113-128.

DESCRIPTORS: Issue awareness/knowledge of issues, citizenship action, experimental research, perceptions/beliefs, personal responsibility, verbal commitment/intention, energy education

VARIABLES: Whether or not a person heard President Carter's address, belief that the natural gas shortage was real, awareness that reduced thermostat settings could help the energy situation, and knowing someone who had been laid off due to the shortage.

PURPOSE: To access the degree to which people responded to President Carter's appeal about the gas shortage and to compare the results of a door-to-door interview technique and a random telephone strategy to obtain data on thermostat setting and other energy-related behavior.

SUBJECTS: The subjects were 419 residents of a small city in central New York State. There were 2 groups of subjects corresponding to two surveys: a door-to-door survey and a telephone survey.

RESEARCH DESIGN: A total of 101 interviews were completed in this survey, with 8 refusals (8%). The second sample was chosen based upon a computer-generated list of random telephone numbers. A total of 168 telephone interviews were completed, with 6 refusals. The basic survey consisted of ten questions developed for this research, four of which concerned the energy crisis.

RESULTS: Only 27% of the people surveyed had their thermostats set at 65 degrees or lower. Public response to Carter's appeal was not as dramatic as might be desired. No difference was found in the thermostat setting of people who believed the natural gas shortage was real in comparison to those who believed it wasn't. Clear differences were found between the two survey methods for several variables including discrepancies in reported versus observed thermostat setting. It appears clear that caution should be exercised in accepting telephone survey data in research in this area.

REFERENCES: 24 cited

141. Maloney, M. P., Ward, M. P., & Braucht, G. N. (1975). A revised scale for the measurement of ecological attitudes and knowledge. American Psychologist, 30(7), 787-790.

DESCRIPTORS: Issue awareness/knowledge of issues, citizenship action, instrument development, descriptive research, knowledge, attitudes, verbal commitment/intention, behaviors

VARIABLES: Attitudes toward taking citizenship action (VC), level of actual citizenship action (AC), level of emotionality regarding environmental issues (A), and knowledge about environmental issues (K).

PURPOSE: To refine and shorten an existing instrument for measuring antecedent variables relative to modification of human environmental behavior.

SUBJECTS: Samples of convenience were obtained from: the Sierra Club Conservation Committee members (n=32), students in lower division psychology courses at California State University-Los Angeles (n=56), and Los Angeles (LA) residents with less than 13 years of education.

RESEARCH DESIGN: Items for the revised instrument were selected by computing an item-total subscale correlation for all items in the VC, AC, and A subscales. Criteria used were: 10 item total for each subscale, 50/50 split on direction of wording of items in each scale, and items having the highest item-total correlation (on original-length scale) were selected. The K subscale items were selected based on: exclusion of geographical items and the exclusion of items vulnerable to outdating.

RESULTS: On the AC and K subscales all three groups differed significantly ($p<.01$). On the VC subscale Sierra Club subjects differed significantly from college and noncollege subjects ($p<.01$), while the latter groups differed at the .05 level. On the A subscale noncollege subjects differed significantly from the college and Sierra Club subjects ($p<.01$), while the latter groups differed at the .05 level. Correlations (part-whole) between the original and revised forms for the subscales were .95, .94, .92, and .94 for the A, VC, AC, and K subscales, respectively.

REFERENCES: 3 cited

142. Manning, R., & Potter, F. (1984). Computer simulation as a tool in teaching park and wilderness management. The Journal of Environmental Education, 15(3), 3-9.

DESCRIPTORS: Higher education, cognitive, program implementation, descriptive research, formal, simulations, resource management education

VARIABLES: Average trail encounters per party per day, average camp encounters per party per day, percent of party days and nights meeting acceptable standard of solitude.

PURPOSE: To demonstrate the benefits of simulation, and specifically the Wilderness Travel Simulation Model, as an aid to teaching park and wilderness management.

SUBJECTS: College age students involved in a recreation management course at the University of Vermont.

RESEARCH DESIGN: A theoretical research method was used. Subjects were given various types of input data to code their computer with and then asked to use the WTSM to gain various output data. Input data collection techniques included information from trail registers, user permits, or surveys of a sample of recreation parties. Neither reliability nor validity estimates were included.

RESULTS: Several major management principles were demonstrated. These include: 1) recreation use patterns are typically highly uneven, and this is at the root of many recreation management problems; 2) temporal and spatial redistribution of use are potentially more effective management practices than simple across-the-board decreases in use; 3) the spatial dimension of visitor use is a more limiting factor than the temporal dimension; 4) management attention should be focused primarily on spatial aspects of visitor use; and 5) advantages of the use of the model substantially outweigh the disadvantages.

REFERENCES: 18 cited

143. Marshdoyle, E., Bowman, M. L., & Mullin. G. W. (1982). Evaluating programmatic use of a community resource: The zoo. The Journal of Environmental Education. 13(4), 19-26.

DESCRIPTORS: Ecology education, community resource, elementary, middle/junior high, affective, program evaluation, pre-experimental research, descriptive research, field trip, knowledge, attitudes

VARIABLES: Teachers' objectives and preparation for a zoo field trip (survey variable).

INDEPENDENT VARIABLE: A zoo field trip conducted by a docent.

DEPENDENT VARIABLE: Student learning of animals, their habitat and food habits.

PURPOSE: To assess the impact of a student field trip to a community resource, the zoo, as a mechanism for environmental education. More specifically, to determine the degree of student learning of wildlife information while on zoo field trips; what teachers objectives are; and what differences exist between teachers that integrate a school field trip into classroom teaching and those that do not.

SUBJECTS: Sixty randomly selected Ohio teachers who had previously taken their classes to the zoo were sent a teachers' objective probe survey. Response rate was 77% (n=46). Two student groups from the same school were employed to access student learning from the zoo field trip. Group one consisted of 34 fourth- and fifth-grade students. Group two contained 35 fifth- and sixth-graders. Sampling procedures were not described.

RESEARCH DESIGN: The teacher survey consisted of 3 questions to assess the teacher's purpose for conducting a field trip and 2 questions to assess teacher preparation and follow-up activities regarding the zoo field trip. In each of the student groups, one-half of the subjects were given a placebo pretest, others received a pretest focusing on wildlife knowledge one day before the field trip. The test measured students' knowledge of food chains, wildlife habitats and wildlife ecology. The placebo pretest consisted of games and quizzes from Ranger Rick magazine. The treatment was a 1-1/2 hour zoo tour conducted by trained docents. Groups were administered the same pretest as a posttest measure on the day following the field trip.

RESULTS: Over 73% of the teachers agreed or strongly agreed that the most important consideration for selecting the zoo as a field trip site was because educational opportunities are available. Ninety-seven percent (97%) agreed or strongly agreed that students should have fun on the zoo field trip even though the main objective was educational. Positive correlations existed between educational value statements and satisfaction items. Negative correlations existed between statements indicating lack of control, inability to set objectives, students' perceptions of "fun time" and satisfaction items. Respondents also favored the expansion of the zoo's educational role in zoo field trips. Analysis of the difference in students' pre and posttest scores using appropriate t-tests. Alpha level = .05. Results indicate no significant posttest differences between groups. The pretest did not affect posttest performance. In all sections of the test but one significant pre- to posttest differences were found. The researchers concluded that learning did occur as a result of the school zoo field trip.

REFERENCES: 25 cited

144. Martin, W. Wade/ Falk, John H./ Balling, John D. (1981) Environmental effects on learning: The outdoor field trip. Science Education, 65(3) pp. 301-309.

DESCRIPTORS: Ecology education, field trip, outdoor classrooms, elementary, outdoor education, knowledge

INDEPENDENT VARIABLE: The learning environment, familiar vs. novel.

DEPENDENT VARIABLE: Knowledge gain of ecological principles.

PURPOSE: To determine the effects of a familiar vs. a novel environment on knowledge gain.

SUBJECTS: Sixty-three students in a ecology program from the Baltimore-Annapolis area were used as the sample for this 1976 research project. Ages ranged from 10-13 with the mean age of10.9 years. Fourteen females and 19 males (33 total) had participated in the program before. These students did not meet the criterion of the total unfamiliarity with the environment. The remaining students, 10 female and 20 male (30 total) met the natural setting unfamiliarity/novel criterion. Two males were latter dropped because of missing data.

RESEARCH DESIGN: Quasi-Experimental, Nonequivalent Control Group Design.

Pre and post test measurements of knowledge of ecological concepts were taken in both environments, the novel and the familiar, after each day. The same teacher was used for all of the classes and was not aware of the research project. The ecology program was performed 2 days at the student's playground, 1 day in a unfamiliar natural area, and 1 day again at the student playground. Both the pre and post test had a reliability of 0.71.

RESULTS: According to the author, the results of this experiment supports that novel environmental settings are poor for imposed task learning when compared to familiar environments. This information was obtained from a comparison of test scores from both environments. Pearson r for the pretest scores at each location are $r(28)=0.077$, $p > 0.05$. Transformed scores were entered into a 2x2 analysis of variance with two within subject factors, test time (pre-post) and environment (fimiliar-novel). No overall main effect for test environment occurred. Subjects did show a significant increase in knowledge of the novel setting, $t(27)=2.06$, $p<0.05$. Task related concept learning did occur, as reflected by a significant main effect for test time, $F(1-27)=4.54$, $p<0.05$. Significant interaction appears between environment and test time, $F(1-27)=5.37$, $p<0.05$. Increased research is recommended by the author.

REFERENCES: 27 cited

145. Mason, R., Boersma, L., & Falkenberry, G. D. (1988). The use of open and closed questions to identify holders of crystallized attitudes: The case of adoption of erosion-control practices among farmers. Rural Sociology, 53(1), 96-109.

DESCRIPTORS: Instrument development, theoretical research, perceptions/ beliefs, attitudes, behavior

VARIABLES: Perceived increase or decrease in soil erosion; perception about problems of topsoil loss; and perceptions about soil erosion filling roadside ditches with silt.

PURPOSE: To compare different approaches to evaluating the relationship between the attitudes and behavior of farmers by asking about their attitudes regarding soil erosion and the behaviors they undertake in soil erosion control.

SUBJECTS: Randomly selected farmers from Willamette Valley, OR. Response rate was 87.0% (n = 251).

RESEARCH DESIGN: Face-to-face interviews using open and closed thought questions were conducted. Open-ended questions were used to assess thinking about soil erosion. Respondents with uncrystallized attitudes about soil erosion were identified and removed from the sample through post-facto filtering. Two sets of criteria were imposed upon the sample to reduce its size and evaluate the consistency between attitudes and behavior. Behavior was measured as the number of erosion control practices farmers said they adopted.

RESULTS: One-way analysis of variance and t-tests were used. Alpha level = 0.05. Responses to closed attitude questions have sufficient error that falsely hides and alters the Attitude-Behavior (A-B) relationship. Responses to open-ended questions were useful in identifying holders of crystallized attitudes in sample surveys, and responses by holders of crystallized attitudes were thought to be more reliable and stable. Filtering of uncrystallized attitude holders from the sample can reveal an obscured A-B effect. Filtering is a usable strategy for operationalizing crystallization in lists of attitude-behavior relationships.

REFERENCES: 25 cited

146. Mayer, V. J., Armstrong, R. E., (1990). What every 17-year old should know about Planet Earth: The report of a conference of educators and geoscientists. Science Education, 74(2), 155-165.

DESCRIPTORS: environmental sensitivity, elementary, middle/junior high school, secondary, cognitive, affective, program development, formal, science education, global education

VARIABLES: The content and concepts of K-12 Planet Earth education.

PURPOSE: To identify those understandings about Planet Earth that every citizen needs to know in order to live a responsible and productive life in our democracy.

SUBJECTS: Nineteen recognized earth scientists and approximately twenty earth science educators from throughout the United States.

RESEARCH DESIGN: Expert consensus report on national conference to set the stage for curriculum reform in earth science education leading into the next century. The conference participants heard keynote speakers and responded to short papers regarding what every high school student should know about the specialty areas of the attending scientists. Discussion and deliberation reduced these ideas to a single set of recommendations.

RESULTS: A list of eight critical issues for Planet Earth education, four broad goals, and 10 concept categories were agreed upon by the conference participants to form a framework prerequisite for an evolving 21st century view of Planet Earth. It was noted that two of the broad goals in particular (Earth stewardship and aesthetic appreciation) were significantly different from similiar conferences held twenty years ago.

REFERENCES: 2 cited

147. Mayer, V., & Fortner, R. (1987). Relative effectiveness of four modes of dissemination of curriculum materials. The Journal of Environmental Education, 19(1), 25-30.

DESCRIPTORS: Middle/junior high, teacher education inservice, program evaluation, descriptive research, interdisciplinary, science education, marine education

VARIABLES: Methods of dissemination of curricular materials.

PURPOSE: To evaluate the relative effectiveness of four different modes of dissemination of a middle school program (OEAGLS) which teaches marine and aquatic environment activities.

SUBJECTS: Subjects were participants from: 1) short 1 1/2 day awareness workshops, 2) long (2-week) implementation workshops, 3) persons who ordered the OEAGLS program through the mail, and 4) teachers who attended a museum program which incorporated OEAGLS.

RESEARCH DESIGN: An interdisciplinary instructional activities program focusing on the natural environment, history, geography, and economics of the Great Lakes region (OEAGLS) was developed by a project funded by the Ohio Sea Grant Program. Four modes of disseminating OEAGLS were used as identified in the Purpose section above. A 30 percent random sample was drawn from the awareness workshop, implementation workshop, and mail order populations, and a 20 percent random sample was drawn from the museum student program population. A questionnaire developed to determine the relative usage of OEAGLS was mailed to the individuals in the samples. A combination of follow-up techniques resulted in the following response rates: awareness sample = 78 percent, implementation sample = 76 percent, mail orders sample = 61 percent, and museum sample = 48 percent. A telephone survey of a 20 percent random sample of the non-respondents was conducted to determine the equivalence of the respondents and the non-respondents on certain variables. The actual number contacted in each group was too small to do statistical comparisons, but it appeared that there were no differences between non-respondents and respondents on use of OEAGLS activities and on other items chosen from the questionnaire.

RESULTS: A one-way analysis of variance was performed on the use variable between the groups. The between group differences were significant at the .0001 level. It was found that short, intensive workshops were more effective than longer workshops both in participant use of materials and in transmission of the materials to other potential users. The difference in usage seems to be related to differences in the professional orientation of teachers attracted into the two different types of workshops. Those individuals who took the trouble to mail order the materials used them but at a somewhat lower frequency than those who participated in workshop. It is concluded that short intensive workshops are the most cost-effective way of ensuring usage of the type of curriculum materials disseminated in this program.

REFERENCES: 14 cited

148. McClaskie, S.L., Napier, T.L., & Christensen, J.E. (1986). Factors influencing outdoor recreation participation: A state study. Journal of Leisure Research, 18(3), 190-205.

DESCRIPTORS: Environmental sensitivity, community resources, model building, descriptive research, case study, social background, outdoor education

INDEPENDENT VARIABLES: 1) Primary income earner's youth participation in boating, fishing, camping, and hunting (traditional activities); 2) Mate's youth participation in boating, fishing, camping, and hunting (traditional activities); 3) Primary income earner's youth participation in picknicking, trail activities, bicycling, local parks and playgrounds, and swimming (local park activities); 4) Mate's youth participation in picknicking, trail activities, bicycling, local parks and playgrounds, and swimming (local park activities); and 5) Primary income earner's childhood residence.

DEPENDENT VARIABLES: Frequency of participation in outdoor recreation activities during the preceding recreation year.

PURPOSE: To develop predictive models of outdoor recreation participation.

SUBJECTS: 5,215 randomly selected license plate owners in Ohio.

RESEARCH DESIGN: A descriptive survey design was used. Data were collected from a randomly drawn sample of license plate owners in a Ohio. A total of 5,125 license plate holders were mailed a questionnaire with a letter explaining the purpose of the study. A postcard was mailed to non-respondents two weeks after the initial mailing. Incentives were offered for responding and 3,028 were returned of which 2,341 were used (687 had missing data or the respondent could not be located).

RESULTS: Early life experiences associated with traditional outdoor recreation activities was consistently one of the better predictors of outdoor recreation participation. Primary income earner youth participation in park activities was also a significant variable. Mate's early life experiences in outdoor recreation activities were relatively inconsequential. The best overall predictor of outdoor recreation participation was ease of use of recreation areas. Interaction elements associated with outdoor recreation participation are motivators of greater participation. Differences in participation among social classes was minimal. Negative perceptions of fee structures did not act as a barrier and did not reduce participation. Place of early residence findings were not significant. Future theoretical modeling should place more emphasis on early childhood experience and explore transfer of recreation skills from early childhood.

REFERENCES: 35 cited

149. McGeachy, L. (1988). Trends in magazine coverage of environmental issues, 1961-1986. The Journal of Environmental Education, 20(2), 6-13.

DESCRIPTORS: Descriptive research, conservation education, resource management education, issue-based

VARIABLE: Content coverage of environmental issues in four national consumer magazines.

PURPOSE: To assess the trends in the coverage of environmental issued by popular magazines during the years 1961-1986.

SUBJECTS: The Reader's Guide to Periodical Literature and four national consumer magazines (Audubon, Science News, Saturday Review, and Time) from the years 1961, 1966, 1971, 1976, 1981, and 1986.

RESEARCH DESIGN: The selected periodicals were used to assess trends in the coverage of environmental issues. Specific trends assessed included number of environmental articles published, amount of issue coverage, and reporting styles. The number of environmental articles was tabulated according to subjects listed in the Reader's Guide. Coverage of issues was determined using a content analysis design adopted from an earlier study. Assessments of reporting styles included classification of sources, bias use of sources, and risk stressed by an article. Sources were classified using an adopted list taken from a previous study. Bias in an article was coded either as disfavor or favor toward a particular group, organization, or individual. Categories for amount of risk stressed were categorized according to "Risk stressed", Risk mentioned", "No risk mentioned", and "Not applicable" responses.

RESULTS: Percentages and raw scores were used to test hypotheses generated in the study. Data indicated that environmental coverage reached its peak during the early 1970s and dropped at level higher than the 1960s' coverage after 1971. Environmental articles also became less specialized from the 1960s to 1980s for all four magazines. Data on reporting styles indicated that there were changes in the sources used and the number of biased articles published. A trend toward mentioning risk was also observed.

REFERENCES: 14 cited

150. McLean, ____ (1983). Developing mission statements for nature centers. The Journal of Environmental Education, 14(4), 19-22.

DESCRIPTORS: Environmental/nature centers, teacher education inservice, program development, descriptive research, perceptions/beliefs, outdoor education

VARIABLES: Conservation education, program development, ICC staff training, support activities.

PURPOSE: To identify current user perceptions of the goals/missions of the Iowa Conservation Education Center (Center), and to identify a methodology with would provide for employee, management input into preparation of goal/mission statements.

SUBJECTS: 151 subjects encompassing two populations: (1) leaders of all groups who used the center during 1979, and (2) personnel of supervising level or above from the Iowa Conservation Commission.

RESEARCH DESIGN: A descriptive research employing questionnaires and the

Delphi Technique, using 20 individuals selected for their knowledge of the Center, type of previous contact with the Center, and diversity from other respondents. Validity and reliability measures were not reported.

RESULTS: Level of significance is not reported. Respondents to the questionnaires identified the importance of 19 center activities, using a modified Likert scale. These were further analyzed using a correlation and factor analysis. Three primary missions of the center identified by this study were conservation education, program development, and ICC staff training. Conservation education was perceived as the most appropriate mission. Perceptions of the mission of the Center were not consistent with those of the ICC. Results indicate that this process could be implemented by nature identifying new mission statements.

REFERENCES: 9 cited

151. McLeod, J., Glynn, C., & Griffin, R. (1987). Communication and energy conservation. The Journal of Environmental Education, 18(3), 29-35.

DESCRIPTORS: Issue awareness/knowledge of issues, citizenship action, hypothesis generation, descriptive research, social background, knowledge, attitudes, behaviors energy education

DEPENDENT VARIABLES: Issue salience, knowledge, attitudes, low thermostat setting, total energy conservation behavior.

INDEPENDENT VARIABLES: Use of mass media public affairs content, energy-related mass media and interpersonal communications.

PURPOSE: To examine the relationship of media use to a set of cognitive, attitudinal, and behavioral components of energy conservation.

SUBJECTS: Four hundred five respondents to random digit dialing, living in single dwelling units of predominantly highly educated, white-collar Madison, Wisconsin and 333 respondents to comparable sampling procedure, from single-family units of predominantly lower-middle and working class Milwaukee, Wisconsin.

RESEARCH DESIGN: Data were collected using Likert-type scales, responses to questions, and responses covering actions taken regarding home energy conservation. Frequencies of media usage, indexes of energy communications, and demographic data were also collected. Three hypotheses relative to communication and energy conservation were generated. Validity and reliability procedures and estimates were not reported.

RESULTS: The data were analyzed using correlations. The significance level was set at .05. The researchers found that: 1) conservation behavior does not necessarily follow affected energy conservation knowledge, salience or attitudes; and 2) communication has been influential in conveying the importance of energy as a public issue.

REFERENCES: 47 cited

152. Mills, T., Amend, J., & Sebert, D. (1985). An assessment of water resource education for teachers using interactive computer simulation. Journal of Environmental Education, 16(4), 25-29.

DESCRIPTORS: Experimental research (quasi), teacher education in-service, program evaluation, simulations, attitudes, resource management education

INDEPENDENT VARIABLES: The use of a computerized Water Resource Management Simulator (SRMS) with K-12 educators.

DEPENDENT VARIABLES: Teachers' knowledge and attitudes concerning water resources.

PURPOSE: To create base-line data concerning the potential of inter-active computer simulation for in-service training in water resource management.

SUBJECTS: One hundred fifty-one K-12 teachers enrolled in environmental science education courses in Oklahoma. Teachers were grouped as to elementary (K-8), secondary science (9-12), and all other secondary majors.

RESEARCH DESIGN: A stratified sample of all the subjects (n = 56) were given the WRMS treatment tested. The other stratified sample (n = 95) was tested without the SRMS treatment. The WRMS treatment consisted of 5, 1 1/2 hour sessions of multi-user interactive computer simulations visually presenting hydrologic information and providing opportunities to cooperately develop and evaluate water management strategies. The test instrument included sections on knowledge of water resources and attitudes toward water resources. Validity and reliability were reported for the knowledge portion of the instrument. The attitude portion of the instrument utilized Watkins' (1974) Water Concerns Scale.

RESULTS: T-test results indicated that the treatment group scored significantly higher than the non-treatment group on the knowledge component of the instrument. No significant differences ere found between the groups for the attitude portion of the instrument. The authors concluded that the WRMS appears to be a powerful teaching tool with regard to teachers of various grade levels. The kind of knowledge gained as a result of the WRMS is 2. differences in technology applied by water users, 2. water as a limiting factor, and 3. the potential of conservation to solve water supply problems.

REFERENCES: 11 cited

153. Monroe, M., & Kaplan, S.(1988). When words speak louder than actions: environmental problem solving in the classroom. The Journal of Environmental Education, 19(3), 38-41.

DESCRIPTORS: Middle/junior high, secondary, higher education, ex post facto research, formal, action learning, issue-based

VARIABLES: Independent measure: types of teaching strategies. Dependent measure: the types of problem-solving experiences that former students undertook.

PURPOSES: To determine the most effective teaching strategies for teaching students problem solving skills related to environmental problems.

SUBJECTS: Fifty-one Michigan teachers "who believed that they helped students develop environmental problem solving skills," who volunteered for the study. Only responses from teachers who taught junior high school, high school, or college for at least seven years were considered.

RESEARCH DESIGN: Descriptive research using a by-mail survey of volunteers was conducted. The respondents were asked about their use of, and success with, 33 teaching strategies, as well as questions about their backgrounds and experiences in teaching environmental problem solving. The dependent measure consisted of eight examples of problem solving actions former students might have taken. Two of the examples, "took additional classes related to environmental problems" and "entered the Peace Corps" are given. The others are not. Researchers considered only those responses from teachers who had taught junior high school, high school, or college for at least seven years. The responses to the eight examples were combined and the number of responses for each teacher was used to divide the respondents into three levels of success: high, medium and low. Chi-square and least squares linear regression analyses were used. Some threats to validity and reliability are discussed.

RESULTS: The most successful teachers used five teaching strategies significantly more of ten than less successful teachers: 1) "Case studies" about solutions to environmental problems, 2) "Trying to solve problems," 3) "Case studies" about what students can do to solve a problem, 4)"Talking about what others do" to help solve a problem, and 5) "Becoming aware of others beliefs." Over 46% of the variance was explained by the use of "case studies" (p<.03). Two strategies predicted success for over 49% of the variance: "case studies"(p<.04) and "talking about what others do" (p<.06).

REFERENCES: 9 cited

154. Morrisey, J. T., & Barrow, L. (1984). A review of energy education: 1975 to NEED 1981. *Science Education, 68*(4), 365-379.

DESCRIPTORS: Elementary, middle/junior high, secondary, program evaluation, historical research, descriptive research, synthesis research, multi-disciplinary, formal, energy education

VARIABLES: None.

PURPOSE: To provide science educators with pertinent information about recent developments, issues, and trends in energy education, science education.

SUBJECTS: None.

RESEARCH DESIGN: Synthesis of research articles.

RESULTS: A discussion of the research on energy education yielded the following: there has been a great deal of curriculum development, but little dissemination of such; energy education is to be infused and an interdisciplinary approach is considered the best, however, this may be contributing to the non-acceptance of environmental education in general; teachers need to be exposed to energy education materials in workshops, but there has been little long term follow-up on such teachers; there is a lack of communication among all levels of energy educators, state and local energy agencies; many energy education programs are too specific; a commonly-agreed upon format or approach to energy education must be developed; and energy and environmental educators should join forces.

REFERENCES: 77 cited

155. Moscardo, G. (1988). Toward a cognitive model of visitor responses in interpretive centers. Journal of Environmental Education, 20(1), 29-38.

DESCRIPTORS: Secondary analysis, descriptive research, environmental/nature centers, model building, non-formal

VARIABLES: Mindfulness, impressiveness, exhibit content, exhibit complexity, method of presentation. The following can be seen as indicators of "mindfulness:" subjective feelings of surprise, interest, involvement, control and processing of information, as well as increases of information, changes in the structure of information, and changes in behavior.

PURPOSE: To apply the mindfulness/mindless model to evaluation research to test the hypothesis that (1) mindfulness, as indicated by recall and perceptions of exhibits as interesting, should be related to indicators of satisfaction; and (2) mindfulness should have a curvilinear relationship to complexity of exhibits. The study was also concerned with investigating the relationships between mindfulness and the content of the exhibits and between mindfulness and the way in which information is presented.

SUBJECTS: The unit of analysis is the exhibit, not the individual visitor response. No demographic data on the visitors is given.

RESEARCH DESIGN: The study is based on a secondary analysis of data available from exit interviews at five interpretive forestryvisitor centers in the United Kingdom. The visitors were asked which exhibits they found most interesting and which exhibits they could remember. Each exhibit was given a mindfulness index using percentage responses from the two questions. Visitors were asked which exhibits they thought were impressive. Impressiveness was taken as an indicator of visitor satisfaction, although the author notes the absence of empirical data on this point. In addition, data on content, style of presentation, and complexity of sixty seven exhibits were collected by the author. Complexity levels were computed and content was coded using a four part scheme as well as for integration. Because of the small sample size and the predominance of nominal level of data nonparametric and cross-tabulation analysis was used.

RESULTS: Mindfulness was found to be positively related to impressiveness, with a Spear man's Rho of .73, p = .001 and Pearson's r of .78, p = .001. It was noted that high levels of mindfulness do not directly lead to high levels of impressiveness. Mindfulness was not found to have a curvilinear relationship to complexity. A positive linear relationship was found. Lack of breadth of complexity was suggested as an explanation for this finding. Complexity was found to be a necessary but not sufficient condition for impressiveness. Partial correlation between mindfulness and impressiveness, while controlling for com plexity using Pearson's r was .79. Mindfulness was related to style of presentation, but not to content. Low levels of mindfulness were related to the use of isolate fact, moderate lev els to parts making a whole, and high levels to story telling. Style was also related to complexity, with story telling related to high levels of complexity. The data partially sup ported the proposed link between exhibit factors, mindfulness, and visitor satisfaction. The analyses indicate the usefulness of the mindfulness concept in organizing research.

REFERENCES: 26 cited

156. Neilsen, L., & Schroeder, M. (1983). The comparative analysis of text books for man-environment courses. Journal of Environmental Education, 14(4), 7-11.

DESCRIPTORS: Higher education, ecology education, cognitive, population education, descriptive research, resource management education

VARIABLES: Subject matter, length of text, quality and type of illustrations, types of references, special features.

PURPOSE: To provide overall guidelines for the selection of textbooks for man-environment courses.

SUBJECTS: none.

RESEARCH DESIGN: Subject matter of 12 textbooks chosen as appropriate for man-environment courses were categorized into seven major types: pollution, renewable resources, human population, ecological principles, energy, nonrenewable resources, and socio-political aspects for comparison purposes. Other criteria analyzed included length of text, quality and type of illustrations, types of references, and special features. Validity and reliability procedures and estimates were not given.

RESULTS: Pollution and management of renewable resources were the subject matter areas most extensively covered. Analysis indicates the textbooks tend to be unbalanced in their coverage of major topics. Other characteristics analyzed showed a wide variation in text length, with an average length of 526 pages. There was a 17-fold variation in the number of illustrations. References varied in the number, type and location to a considerable extent. The number of special features was highly variable. The authors recommend their textbook analysis as a means of quickly eliminating inappropriate books. The following four questions were presented as tools for the initial screening and selection of texts for man-environment courses: 1. Is the desired emphasis of the book resource management or environmental pollution? 2. Are topics other than management and pollution of critical importance to the course? 3. Will the book function as a supplement to other materials or as the focus of the course? 4. Is a technical or non-technical approach desired?

REFERENCES: 12 cited

157. Nowak, Peter J. (1987). The Adoption of Agricultural Conservation Technologies: Economic and Diffusion Explanations. Rural Sociology, 32(2), 208-220.

DESCRIPTORS: descriptive research, issue awareness, ecology education, social background, economic background, rural

INDEPENDENT VARIABLES: (1) Information variables: number of times operators contacted extension personnel about general farm management, number of contacts with the U.S. Department of Agriculture, and the number of field days; (2) Economic: farm income, and nonfarm income; (3) Ecological factors: land-use intensity, average corn suitability rating, and field measures

DEPENDENT VARIABLE: Adoption of specific conservation technologies.

PURPOSE: To examine the adoption of agricultural conservation technologies through analysis of diffusion, economic, and ecological factors.

SUBJECTS: All people operating land in two chosen watersheds in east-central Iowa that were selected for saturation sampling.

RESEARCH DESIGN: This is descriptive research in which four contacts were made with respondents over a two-year period using a sample size of approximately 120. This sample size decreased to 89 during the study period due to deaths, retirements, consolidation, and refusals.

RESULTS: Descriptive statistics and Pearson correlation were used to present the results. It was found that larger operations had lower-quality land and do not necessarily adopt conservation tillage practices. There is a positive relationship between acres operated and farm income, labor use, and reliance on credit. Also, there is a negative relation to acres operated and the corn suitably rating.

Because of the small sample size and corn belt location, the results are generalized with caution. It was concluded that economic and diffusion factors are important in predicting the adoption of conservation practices. It is believed that economic incentives and information can be used to reduce the risk of adopting a new conservation practice. Accurate assessment of the ecological surroundings must be done to insure that the appropriate technology is being used.

It was recommended that different conservation practices need to be explained to farmers based on diffusion as well as economic considerations.

REFERENCES: 37 cited

158. Olson, E., Bowman, M. & Roth, R. (1984). Interpretation and nonformal environmental education in natural resources management. Journal of Environmental Education, 15(4), 6-10.

DESCRIPTORS: Environmental/nature centers, program evaluation, experimental research, non-formal, knowledge, attitudes, resource management education

VARIABLES: A brochure disseminated on-site, a series of signs on-site, personal services including off-site presentations and on-site guided hikes. Improving visitor knowledge of and attitudes toward nature preserve management.

PURPOSE: To implement and test a visitor education strategy for its effectiveness in raising levels of knowledge and attitudes toward state nature preserve management.

SUBJECTS: 1,141 preserve visitors ranging in age from 15 to 60+ years, 96% of which had at least a high school education, and 61% were reported as being male.

RESEARCH DESIGN: True Experimental pretest-posttest control group. A stratified random sample of visitors to four Ohio state nature preserves was taken. Sociodemographic, site-specific, knowledge, and attitude data were obtained by a 35-item questionnaire. The SPSS was used to analyze various data from questionnaires. A seven-point Likert-type scale was utilized to deal with visitors' knowledge and attitudes about current policies and regulations pertaining to Ohio natural areas and preserves.

RESULTS: There is a statistically significant (.001) positive relationship between visitors' educational level and correct identification of a state nature preserve. There is a statistically significant (.001) positive relationship between membership in a conservation group and correct identification of a state nature preserve. There is a statistically significant (.001) positive relationship between scores on the knowledge test and scores on the attitude test for all concepts tested. Analyses also showed no relationship between sociodemographic variables and knowledge of or attitudes toward preserve management concepts.

REFERENCES: 8 cited

159. Peter, Paul J. and Olson, Jerry C. (1983). Is science marketing? Journal of Marketing, 47, 111-125.

DESCRIPTORS: Hypothesis building, theoretical research, science education

VARIABLES: N/A.

PURPOSE: To present a new, more useful conception of 'science' to help determine whether the marketing of ideas can be considered a science.

SUBJECTS: N/A.

RESEARCH DESIGN: The presentation is divided into two sections: (1) an analysis of common scientific practices in terms of conventional elements of marketing and (2) a discussion of and comparison between the realistic/constructional perspective and the positive/empiricist view. The total process of marketing theory is discussed.

RESULTS: The authors concluded that marketing can be effectively used to influence the adoption of theories by other scientists and that the realistic/constructional approach is more effective in the production of creative and useful theories than the positive/empiricist view. It is the authors' opinion that the creation of useful knowledge is science's main task. Where the process of marketing can lead to this creation, then marketing is a science.

REFERENCES: 82 cited

160. Pettus, A., & Teates, T. (1983). Environmental education in Virginia schools. Journal of Environmental Education, 15(1), 17-21.

DESCRIPTORS: Program evaluation, descriptive research, investigation, knowledge, attitudes, environmental education

VARIABLES: Responses of public school teachers in Virginia concerning environmental education in their school's curriculum.

PURPOSE: The study was designed to assess the status and progress of environmental education in the public schools of Virginia.

SUBJECTS: There were 595 teachers that responded to the survey conducted in this study. The respondents included 418 females and 176 males with most of the total in the 25-45 age range. About 42% were elem/jr. high teachers and 58% were high school teachers.

RESEARCH DESIGN: The descriptive research study utilized a stratified sampling technique to select a sample of public schools in Virginia for the survey instrument. The 25 item instrument included seven items requesting demographic information, while the remaining were questions or statements regarding information concerning environmental education in the teacher's class and school. A brief definition of environmental education was included in the instrument.

RESULTS: About one-half of the teachers surveyed responded (595). Only 21% related that their school had an environmental education program with a syllabus or guidelines. Among those teachers having an environmental education program, major emphasis was on man's relationship to his environment (61.9%) and environmental awareness (57.6%). Elementary teachers were the highest percentage of those indicating environmental education was part of their curriculum. The survey showed 33.9% of the teachers having some environmental education in their classroom. However 71% of those teachers spent less than one hour per week on such instruction. Only 15.1% of all respondents had participated in an environmental education workshop or course during the past 10 years. The response patterns of this survey were similar to those indicated by school principals in a previous survey. However, almost 72% of the principals indicated their schools provided environmental education, while only 21% of the teachers indicated a planned environmental education program and only 34% said they had environmental education in the courses. The environmental education in Virginia's public schools was noted by the researchers as being "static at best". The study concluded that more emphasis and organization was needed to improve the quality and quantity of environmental education in Virginia.

REFERENCES: 3 cited

161. Pierce, J.C., Lee-Sammons, L., and Lourich, N.P. (1988). U.S. and Japanese source reliance for environmental information. Journalism Quarterly, 65(4), 902-908.

DESCRIPTORS: Issue Awareness/knowledge of issues, sources of information, media based, community resources, descriptive research, cognitive, educational background, social background, ethnic backgrounds, knowledge, values, locus of control

INDEPENDENT VARIABLE: Issue knowledge, information dependence, attention and use.

DEPENDENT VARIABLES: Informational source reliance.

PURPOSE: To examine information source reliance among the citizens of metropolitan Spokane, Wash., and the citizens of coastal cities of Mishima, Fuji and Namazu in Shizuoka Prefecture, Japan, on issues concerning alleged danger of pollution to local water supplies.

SUBJECTS: Two populations were studied. The data were collected in 1983 & 1984 via mail surveys to random samples of households. In Spokane, 1200 names were drawn, 1014 were bona fide contacts, 524 individuals returned usable questionnaires, producing a response rate of 52%. In the Shizuoka Prefecture population, 500 names were drawn in each of the three coastal cities, 1455 were bona fide contacts, 694 returned usable questionnaires, resulting in a 48% response rate.

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RESEARCH DESIGN: The study employed the "total design method" of contacting individuals. This ex post facto design consisted of an initial complete mailing, a follow-up reminder postcard, a second complete mailing to non respondents and a final complete mailing to persistent non respondents. Each population was asked to indicate how important six types of media sources were for acquiring information on the alleged danger of pollution to local water supplies in their respective locations. These media sources were: television, radio, newspaper, friends/neighbors, public meetings, and groups/organizations. The Spokane group used a five-point scale ranging from 1(not important) to 5 (very important), while internal questionnaire design consistency required that Shizuoka respondents be given a seven-point scale. Instruments used were: Likert scale comparisons, correlation statistics and factor analysis tables. Low scale reliability was acknowledged.

RESULTS: Americans and Japanese were found to have similar reliance patterns on mass media - television, newspapers, and radio. However, the Japanese showed a stronger reliance on both mass media and non-mass media informational sources. Both populations relied more heavily on mass media sources than non-mass media. Reliance on sources of environmental information appeared to be independent of the personal attributes (education, participation, knowledge and perception of danger) postulated to affect reliance. Spokane respondents ere found to be more likely to differentiate among informational source reliance than Japanese respondents. These results may be indicative of greater social uniformity in Japanese public life. Factor analysis documents substantial differences in the patterning of informational source reliance. The Japanese appeared to view all informational sources in the same context, while the Spokane group differentiated between personal and organizational uses for mass media. Overall scale reliability (Cronbach's alpha) is much higher in Japan than in the United States. The researcher concluded that this study illustrates the importance of cross-national research.

REFERENCES: 19 cited

162. Pomerantz, G. (1986). Environmental education tools for elementary school children: The use of a popular children's magazine. Journal of Environmental Education, 17(4), 17-22.

DESCRIPTORS: Experimental research, program evaluation, formal, investigation, elementary, knowledge, science education

INDEPENDENT VARIABLES: Exposure of the students to the magazine Ranger Rick.

DEPENDENT VARIABLES: Knowledge of animals, plants, and the natural world.

PURPOSE: To evaluate a popular children's nature magazine, Ranger Rick, for its ability to increase children's knowledge of animals and the natural world.

SUBJECTS: There were 491 fifth graders from Wake County North Carolina with 232 in the treatment group and 259 in the control group. The schools were randomly selected and ranged from rural to inner-city.

RESEARCH DESIGN: A pretest/posttest design with random selection of participants was utilized. The treatment groups were given the magazine, Ranger Rick, and the students were given time to read it in class or at home. There was no discussion conducted. The control group was not exposed to theRanger Rick magazines. The questionnaire items represented knowledge of plants, animals, environmental concerns, and ecological concepts.

RESULTS: Multiple analysis of covariance (MANCOVA) (Lindeman, Merenda, and Gold 1980) was used to identify significant differences between responses of treatment and control subjects, males and females, and among children from different areas of residence. The overall F test was significant ($P<.05$), and specific comparisons were analyzed with separate t-tests. The treatment group increased their knowledge of animals, plants, and ecological principles. The treatment subjects who scored significantly higher than control subjects came from city and suburban areas. Treatment and control subjects from town and rural residences did not have significantly different knowledge scores. Children from suburbs outscored children from all other areas. A possible explanation may be that these children read more than children from rural areas, and children who read on a regular basis will glean more information from written material. This study indicates that the magazine can be an educational diversion at home and can be used to a greater extent in the classroom. There were no implications or recommendations for further research.

REFERENCE: 6 cited

163. Powers, R. (1985/86). The commons game: Teaching students about social dilemmas. Journal of Environmental Education, 17(2), 4-10.

DESCRIPTORS: Citizenship action, higher education, affective, pre-experimental, simulations, non-formal, attitudes, citizenship, and science education

VARIABLES: (a) Participants' ratings for the Commons Game Simulation. (b) Development of affective understanding of social dilemmas. (c) Exercises about social dilemmas using Commons Game simulation.

PURPOSE: The purpose of this study was to provide a description of the Commons Game, report students' evaluations of the game, and compare those evaluations to the evaluations obtained from the popular cross-cultural simulation game, BaFa BaFa.

SUBJECTS: The total subjects were 120 players. Of which, 52 were introductory psychology students, 35 social psychology students, and 33 entering freshman students enrolled in the USU's honors program. Neither experimental nor control groups were assigned to this study. Gender and age were not reported.

RESEARCH DESIGN: Pre-experimental design was utilized for this study. The players were given a pretest prior to the game exercises. A posttest was given to the participants after completion of the game exercises. Moreover, the player had to give ratings to the Commons Game simulation. The game was developed by the researcher but the validity and reliability of the game were not reported.

RESULTS: Comparison of the evaluations from the BaFa BaFa to those obtained from the Commons Game were made using a one-way ANOVA. The F test was utilized and the alpha level was set at 0.01. The findings of this study indicate that: (a) The ratings for the Commons Game were favorable, e.g., the players have "realism", "value", and "relevance" of the Commons Game simulation a higher rating the BaFa BaFa, (b) according to the comments of the players, the game provided them with an understanding about social dilemmas and motivated them to discuss possible solutions to these dilemmas. The educational implication of this study is the students can be taught via simulation how to take responsible actions toward existing social dilemmas and how to provide solutions for these dilemmas.

REFERENCES: 11 cited

164. Preston, G., & Fuggle, R. (1987). Awareness of conservation among visitors to three South African nature reserves. Journal of Environmental Education, 18(4), 25-30.

DESCRIPTORS: Issue awareness/knowledge of issues, environmental/nature centers, attitudes, descriptive research, nonformal, cognitive

VARIABLES: Specific wildlife issues, general conservation issues, broad environmental issues.

PURPOSE: To test the awareness of conservation issues among visitors to three Sough African nature reserves and the enhancement thereof as a result of the visit.

SUBJECTS: 452 respondents were interviewed and selected to approximate the reserve sampling frames. The respondents were South African residents, over the age of 14, from higher socioeconomic brackets, and interested in nature. The response rates were 78% at Hluhluwe, 80% at Giant's Castle, and 91% at Londolozi.

RESEARCH DESIGN: A longitudinal survey design using two different but matched questionnaires, containing a battery of 50 questions, was utilized. The two interviews were conducted in the respondent's home language as soon as possible after their arrival and as late as possible before their departure.

RESULTS: A slightly modified Likert scale ranging from strongly agree to neutral to disagree to strongly disagree to don't know was utilized. The McNemar test of symmetry, a nonparametric, chi-square test for matched pairs was utilized, ($p < .05$).Test results indicated that significant increases in awareness of conservation issues were shown by visitors to all oft he reserves. In spite of the statistical significance, the authors made the following observations. The visitor's understanding of reserve management is limited. Crucial environmental issues are not being successfully communicated. Levels of awareness are low and there is a need to develop environmental education in South Africa. Americans have positive attitudes toward animals but mainly toward attractive and emotionally appealing species and this attitude was echoed in this study in South Africa. There is a need to develop and coordinate facilities and programs in South African nature reserves. From these studies it is clear that environmental education in general needs to be improved. There were no recommendations for further research.

REFERENCES: 8 cited

165. Priest, S. (1989). The influence of national characteristics on attitudes and approaches to outdoor leadership preparation. Journal of Environmental Education, 29(3), 34-41.

DESCRIPTORS: Descriptive research, outdoor education, educational background, attitudes, knowledge, values, model buildings

VARIABLES: Attitude and approach to preparing for outdoor leadership.

PURPOSE: To determine the differences in attitude and approach to outdoor leadership preparation for experts from five English speaking nations.

SUBJECTS: Two hundred-fifty (250) experts in outdoor leadership, fifty from each of five nations: Australia, Canada, Great Britain, New Zealand, and the United States.

RESEARCH DESIGN: Descriptive, using a survey consisting of personal interviews and mailings. The survey questions were founded on fourteen components, (seven skills and seven attributes), of effective leadership.

RESULTS: A total of 170 survey responses were obtained (68 percent return rate). The return rates ranged from 64 percent to 72 percent. The various responses were analyzed for differences among the nations by ANOVA (for the interval ratings) and Kruskal-Wallis (for the ordinal rankings) tests. These tests indicated significant differences in respondents attitudes toward the importance of the fourteen components.

REFERENCES: 22 cited

166. Proper, R., Wideen, M., & Ivany, G. (1988). World view projected by science teachers: A Study of classroom dialogue. Science Education, 72(5), 547-560.

DESCRIPTORS: Issue identification and analysis skills, middle/junior high school, secondary, descriptive research, science education, knowledge, beliefs, lecture, content analysis

VARIABLES: World views projected in teacher talk, method of projection of world views.

PURPOSE: To examine ways middle school teachers project world views in classroom science teaching.

SUBJECTS: Twenty-two eighth, ninth, and tenth grade science teachers from two randomly selected school districts in British Columbia were selected for participation in the study. Three normal classroom science lessons from each of the teachers were recorded by an observer. These recorded lessons (N=65) were content analyzed to determine the world views being projected.

RESEARCH DESIGN: The reliability of an analytical scheme developed by Kilbourn (1976) was determined by analyzing sections of biology textbooks. The Kilbourn instrument was then used to content analyze the recorded classroom science lessons to determine what world views are presented, and if those world views were presented openly or in a hidden manner. Links between world views and content areas were also examined.

RESULTS: After determining the inter-rater reliability to be at least 70%, the Kilbourn analytical scheme was judged to be adequate for the purposes of the study. The 65 recorded lessons were found to contain 54 projected segments. These segments were organized into four world views- formism, mechanism, contextualism, and organicism. The 54 sections fit into 65 projections (some sections fit into more than one projection or world view). The projections were also classified into four subject areas- biology, physics, chemistry, and earth science. World views were not generally projected openly, but by covert implication or assumption.

REFERENCES: 21 cited

167. Protess, D. L., Cook, F. L., Curtain, T. R., Gordon, M. T., Leff, D. R., McCombs, M. E., & Miller, P. (1987). The impact of investigative reporting on public opinion and policymaking: Targeting toxic waste. Public Opinion Quarterly, 51(2), 166-185.

DESCRIPTORS: Issue awareness/knowledge of issues, affective, model building, ex post facto research, urban, attitudes, behaviors, issue-based, media based, television.

INDEPENDENT VARIABLE: Exposure to the three-part television series, "Wasted Time," about the toxic waste disposal practices of the University of Chicago.

DEPENDENT VARIABLES: Attitudes about the importance of community issues (toxic waste disposal, environmental pollutants, violent crime, unemployment, police brutality, child abuse), attitudes about the competence of government regulatory agencies, level of anxiety about hazardous waste, affective responses to news stories, and behaviors regarding toxic waste.

PURPOSE: To explore the conditions under which news media investigative reports affect the attitudes, agendas and actions of the general public and the policy elite.

SUBJECTS: The general public sample consisted of 395 residents of the Chicago Metropolitan area. These people were selected using the random-digit dialing technique, then stratified into regular Channel 5 news watchers and nonwatchers. Over half (59%) were female and about a third (35.3%) later classified as series aware. Nonresponse error was not reported, but experimental mortality was listed as 40.5%. In contrast, a purposive sampling technique was used to choose 40 policy elites. These included state legislators, administrators for environmental protection agencies, city council members and university officials. Experimental mortality was 22.5% and series awareness was 74.2%.

RESEARCH DESIGN: This was the fourth in a series of case studies. An ex post facto research design with a pretest and a posttest was used. Telephone interviews were conducted two weeks prior to the series being aired, then repeated one week afterwards. Twelve Likert-style items relating to general environmental issues and six to hazardous waste disposal were embedded on the 40 item survey. Policy elites were also asked to describe related policy-making activities in the past, present and future. Policy developments were assessed by contacting additional policy elites and by analyzing subsequent government initiatives. A pre- and post-series content analysis of environmental issues coverage by the local media was conducted. Instrument validity and reliability was not reported.

RESULTS: Using the posttest score as a covariate, an analysis of covariance (ANCOVA) revealed no significant series effects on the general public. Toxic waste disposal was rated consistently low on reported agendas. In contrast, policy elites showed changes. Performance evaluations for three of the four government agencies mentioned in the series declined significantly ($p < 0.05$) after the series aired. In addition, the importance of environmental pollutants (but not toxic waste disposal) was rated significantly higher in the posttest, and significantly more time was expected to be spent on toxic waste problems in the future. The morning after the first segment, the Chicago Fire Department inspected the storage rooms in question and cited the university for 20 safety violations. This event was covered by several newspapers and by Channel 5 news, yet post-series ones were not. The researchers speculated that the low public and policy elite concern was due to the apparent speed of dealing with the problem. In their review of the case studies, they theorized that the way the media portrayed the issues and the frequency of past media attention had the greatest influence on public attitudes. The strongest effects were produced when the presentation was unambiguous and the issue was nonrecurring. Investigative journalism tended to put policy-makers on the defensive, producing some policy impact in each study.

REFERENCES: 25 cited

168. Rakow, S. J. (1983-1984). Development of a conceptual structure for aquatic education and its application to existing aquatic curricula and needed curriculum development. Journal of Environmental Education, 15(2), 12-16.

DESCRIPTORS: Marine education, secondary, interdisciplinary, descriptive research, knowledge, attitudes, program evaluation

VARIABLES: Perceived knowledge of selected aquatic topic, perceived importance of selected aquatic topics.

PURPOSE: To develop a conceptual structure for aquatic education and, its application to classification of existing curricula and determination of future curriculum needs.

SUBJECTS: Subjects were fifty-five secondary teachers from Northern Minnesota attending an environmental workshop.

RESEARCH DESIGN: A combined effort of various individuals involved in developing aquatic education materials at the University of Minnesota resulted in the list of eight Minnesota Water Topic Areas. The list was divided into three broad categories - Water and Society, Water in Nature, and Attitudes and Experience. A detailed description of each category and its subtopics was provided. The researcher classified existing aquatic curricula and conducted a needs assessment using the list as a framework. Data for the needs assessment were collected using a questionnaire adapted from a study done by the Mississippi-Alabama Sea Grant Program. Questionnaire items consisted of 16 water topics that were classified into the Water Topic Areas categories. The questionnaire employed was a 5-point Likert-type. Subjects were asked to evaluate their perceived knowledge of selected topics and rank order them.

RESULTS: Means and standard deviations for the variables perceived knowledge and importance of selected aquatic topics were reported. Assessment of teachers' knowledge of selected topics indicated that teachers had adequate knowledge on "properties of Water" and less than adequate knowledge on "Water in Our Daily Lives". Properties of Water received the highest priority with Waster in Our Daily Lives the lowest. The researcher concluded that teachers gave the highest priority to aquatic topics in which they are most knowledgeable. Based on the results, the researcher recommended that inservice training and future aquatic curricula include those topics that teachers felt less knowledgeable about and those that received the highest priority. A suggestion for evaluation of existing curricula was also included.

REFERENCES: 3 cited

169. Ramsey, J., & Hungerford, H. (1989). The effects of issue investigation and action train ing on environmental behavior in seventh grade students. Journal of Environmental Education, 20(4), 29-35.

DESCRIPTORS: Issue investigation and evaluation skills, citizenship action skills, environmental sensitivity, knowledge, locus of control, middle/ junior high school, experimental research, science education

INDEPENDENT VARIABLE: Issue investigation and citizenship action training.

DEPENDENT VARIABLES: Overt environmental behavior, individual locus of control, group locus of control, environmental sensitivity, knowledge of environmental action skills, and perceived skill in the use of environmental action skills.

PURPOSE: To determine the effects of a formal environmental education methodology (issue investigation and action training) on middle school students.

SUBJECTS: Eight heterogeneously grouped seventh-grade classes representing schools in rural southwestern Illinois, rural northwestern Kentucky, and urban Kansas City, Missouri. Four experimental groups were employed and four control groups. The experimental $n = 64$. The control $n = 85$. Groups were equated on three dependent variables: (1) individual locus of control, (2) group locus of control, and (3) overt environmental behavior.

RESEARCH DESIGN: A quasi-experimental, modified pretest-posttest design was used. Subjects in the experimental groups received eighteen weeks of treatment while subjects in the control groups received eighteen weeks of typical junior high school general science curricula (physical science). Instruments used were modifications of ones previously used by the researcher and others. Test-retest reliability was determined and reported in previous articles. No validity estimates were reported. Instruments were both phenomenological and Likert types. The phenomenological scoring protocol was reported in detail. Validity threats were acknowledged.

RESULTS: Analysis of variance and t-tests were used to measure statistical differences. An alpha level of .05 was selected. Students in the experimental groups performed significantly better than students in the control groups on all variables except "environmental sensitivity". Significant results were observed in overt behavior, individual and group locus of control, knowledge of and perceived knowledge of environmental action skills, and perceived skill in the use of environmental action skills. The researchers concluded, among other things, that issue investigation and action training promoted responsible environmental behavior among seventh-grade students. The incorporation of such training was recommended if responsible citizenship behavior was desired.

REFERENCES: 10 cited

170. Ritchie, B. J. R., McDougall, G. H. G., & Claxton, J. D. (1981). Complexities of household energy consumption and conservation. The Journal of Consumer Research, 8(3), 233-242.

DESCRIPTORS: model building, descriptive research, attitudes, knowledge, economic background, behaviors

INDEPENDENT VARIABLES: Climate, house/appliance/vehicle characteristics, household demographics, attitudinal variables.

DEPENDENT VARIABLES: In-home and automobile energy consumption.

PURPOSE: To determine factors that influence energy-consuming behaviors and the nature of each influence.

SUBJECTS: A nationwide sample of 2,366 Canadian households.

RESEARCH DESIGN: Descriptive research. A mail survey was used to collect data regarding house/appliance/vehicle characteristics, household demographics and attititudinal variables. Survey items were from a pre-existing instrument. Heating fuel and electricity consumption data were obtained directly from utility companies. Validity and reliability estimates were not reported.

RESULTS: Using an exploratory subsample, data in each of the four predictor subsets were analyzed using multiple regression (alpha < 0.5) to determine a "best" exploratory model. This model then was tested on two replication subsamples. For in-home energy consumption, eight variables in the exploratory and replication analyses were significant predictors. For automobile gasoline consumption, seven variables in the exploratory and replication analyses were significant predictors. It was concluded that dwelling and vehicle descriptors were strongly correlated with energy consumption, while both male and female attitudes were weakly associated. Implications for conservation policy and research recommendations are listed.

REFERENCES: 27 cited

171. Rosenthal, Dorothy B. (1989). Two approaches to science-technology-society (S-T-S) education. Science Education, 73(5); 581-589.

DESCRIPTOR: Issue Investigation

PURPOSE: The author, in this "think piece", investigates the issue of applying the two perspectives of science-policy studies and social studies of science to Science-Technolgoy-Society (S-T-S) Education.
Science policy studies are issue-oriented, and therefore contrast with social studies of science, which approaches science from perspectives such as sociology or philosophy. S-T-S Education is a holistic method whereby science is taught from many perspectives, and often combines biology, chemistry, etc., in the same course rather than splitting the subjects themselves up into separate courses.

RESULTS: The author attempts to ascertain that S-T-S Education is a legitimate approach to the sciences. It can be, itself, taught in two different ways, depending on the teachers' background and what he/she is comfortable with. They can teach it from a social issues approach, or a social aspects of science approach. The social aspects of science approach, the author states, may be more enduring as social issues change rapidly. The author states that a synthesis of the two approaches may yield the best results.

References: 24 cited

172. Rosenthal, D. B. (1985). Global issues in high school biology text books. American Biology Teacher, 47(8), 459-462.

DESCRIPTORS: Descriptive research, global education, science education, issue-based

VARIABLES: Length of text, space devoted to social issues.

PURPOSE: To determine the extent of treatment of social and global issues in 22 high school biology textbooks published between 1963 and 1983.

SUBJECTS: 22 high school biology texts published between 1963 and 1983. 19 were identified as among those most frequently used in biology classes and/or having the greatest percentage of national sales in 1976. Three texts that were first editions dated 1980 or later were added to give additional data. A listing of all textbooks is included.

RESEARCH DESIGN: A questionnaire to determine social issues was mailed to 25 experts in biology, ecology, bioethics, social studies, and science education. The questionnaire included a list of 87 specific social issues and 14 categories of social issues. Respondents were asked to group the issues into most suitable category. 20 surveys were returned and the number of categories of social issues was reduced to 12. Researcher then measured the length of each text to the nearest tenth of a page (excluding title pages, reading lists, illustrations, summaries, questions, etc.). Texts were read in random order. Contents were classified as to whether or not they dealt with one or more of the 12 social issues. Space devoted to each category was measured and expressed as a percentage of total text length. Then, the lengths of each global issue in each textbook were added together to provide perspective on total global dimensions of each book.

RESULTS: The 12 categories of social issues in high school biology textbooks were as follows: the nature of science, the sociology of science, human behavior, population, food supply/agriculture, human reproduction, human genetics, human health, evolution, energy resources, environment, and space research and exploration. Researcher found that only one to five percent of space in each textbook was devoted to global perspectives of social issues and that global dimensions were found almost exclusively in only five of the 12 categories: population, food supply/agriculture, human health, energy resources, and environment. Conclusions were drawn that U.S. is isolated from the rest of the world in biology education and that textbooks give little recognition to the impact of current issues outside the U.S.

REFERENCES: 22 cited

173. Ross, D., & Driver, B. (1986). Importance of appraising responses of subgroups in program evaluation: The Youth Conservation Corps. Journal of Environmental Education, 17(3), 16-23.

DESCRIPTORS: Outdoor classrooms, environmental sensitivity, secondary, program evaluations, conservation education, non-formal

VARIABLES: Socioeconomic, demographic/minority, race, enrollees, unsuccessful applicants, participants of YCC program.

PURPOSE: To assess possible long-term perceived benefits to program participants, and demonstrate empirically the importance of analyzing responses of specific subgroups in program evaluations, further to document how the summer 1979 YCC program provided different types of benefits of different types of enrollees.

SUBJECTS: A youth group consisting of 1349 enrollees and a control group of 510 unsuccessful applicants to the YCC program. Further, a parent group comprised of 1160 parents of enrollees, and 610 parents of unsuccessful applicants to the program. All the youth were between the ages of 15 and 18.

RESEARCH DESIGN: A descriptive, longitudinal design was used employing two experimental and control groups. The questionnaires were mailed to youth and parent experimental and control groups at 9 months and 26 months after the end of the 1979 YCC program. No pre-camp test measures were deemed necessary. The questionnaire contained two basic types of questions, economic and demographic characteristics, and 121 questions designed to measure beneficial changes in knowledge, attitudes, skills, and behaviors on a perceived benefit scale. The internal consistency was 0.60 or higher. Return rate for the 9-month group was 74%, for the 26-month group 66%.

RESULTS: Absolute differences for the mean scores were low. A total of 41 statistically significant ($p > 0.02$) differences were found. However, the program does benefit enrollees but only minimally. Given that the program lasted only 4-8 weeks, and that benefits were measured 26 months after participation, there was a positive benefit to enrollees, but changes in attitude and behaviors are difficult to achieve in the age group studied. The YCC program should be targeted to particular types of youths, and specific types of enrollees.

REFERENCES: 15 cited

176. Roth, R., & Perez, J. (1989). Twelfth grade student knowledge and attitudes toward the environment in the Dominican Republic: An assessment: Journal of Environmental Education, 20(3), 10-14.

DESCRIPTORS: Secondary, cognitive, affective, program evaluation, descriptive research, educational background

VARIABLES: Student's perception of local and national environmental problems, sex of the respondent, type of school curriculum pursued, and sources of environmental education.

PURPOSE: To assess the environmental knowledge and attitudes of Dominican students in the twelfth year of school who had received no exposure to environmental education.

SUBJECTS: A random sample of 690 twelfth grade Dominican students were selected for the study. No treatment or control groups were utilized.

RESEARCH DESIGN: A descriptive research design was used. A test containing sixty items organized into a knowledge section (factual and conceptual) and an attitudinal section was evaluated by two panels of specialists before distribution to students. No validity or reliability estimates were given.

RESULTS: Frequencies, chi-square, regression analysis, and correlation were used to analyze the data. In the knowledge section, the total correct response rate was 50%. Students were more successful in answering conceptual items than they were in answering factual items. In the attitude section, the total correct response rate was 55%. Poverty and deforestation were most frequently mentioned by the students as environmental problems. On the national level, air and water contamination, and poverty ranked high. Males ranked significantly higher than females on the knowledge section (p=.0089). No significant differences were found in relation to school type. Forty-three and seven-tenths percent of the students answered that general education in the school provided most of their environmental education. Several recommendations were made regarding the environmental education in developing countries.

REFERENCES: 20 cited

175. Rubba, P., & Wiesenmayer, R. (1988). Goals and competencies for precollege STS edu cation: Recommendations based upon recent literature in environmental education. Journal of Environmental Education, 19(4), 38-44.

DESCRIPTORS: Citizenship action, behaviors, STS education, synthesis of research, middle/junior high school, model building, beliefs, values

VARIABLES: Knowledge of environmental/STS issues, knowledge of environmental/ STS action strategies, ability to apply action strategies, affective attributes, environmentally literate and active citizens.

PURPOSES: (1) To provide a brief overview of why STS education (approached from a social responsibility perspective) should be included in precollege science education; (2) to summarize selected and recent literature on environmental education that has implications for precollege STS education and present a set of goals for STS education that follow from the literature; and (3) To further explicate the goals as a set of student competencies that might be used to guide precollege STS education in selected grades.

RESEARCH DESIGN: A narrative synthesis of recent literature relative to STS educa tion at the precollege level.

RESULTS: A model which communicates that STS education must provide for the development of knowledge, issue investigation skills, action skills, and affective qualities which will result in responsible decisions and actions of citizens as they relate to STS issues. Fifty-three (53) student competencies are presented which involve students in STS issues, an essential component of STS education.

REFERENCES: 22 cited

176. Salleh, A. (1988/1989). Environmental consciousness and action: An Australian perspective. Journal of Environmental Education, 20 (2), 26-31.

DESCRIPTORS: Citizenship action, environmental sensitivity, naturalistic research, action learning, social background, economic background, beliefs, values

VARIABLES: Environmental consciousness and environmental action.

PURPOSE: To triangulate in a practical way the interface between the patriarchal system, the capitalist system, and the ecology movement. This study also attempts to examine the "feminine" side of the ecology movement.

SUBJECTS: The participants were a small group of women from the provincial town of Wollongong on the southern coast of Australia. The participants were over thirty years old and their socioeconomic status was upper working class.

RESEARCH DESIGN: A naturalistic research design was utilized. Each participant kept a diary of group development. The method is described as an adaptation of the consciousness-raising technique because discussions were in part structured by interventions from the researcher. The "feminine" side of the ecology movement has occurred through five phases as follows:

Phase 1: The volunteer women involved in some kind of ecology practices such as paper separation and recycling of aluminum cans and glass bottles.

Phase 2: The women decided to consider the extent of local domestic waste generation in Wollongong.

Phase 3: The women presented themselves as self-actualized individuals who had designed their lives through conscious choice.

Phase 4: The women started speaking up about environmental problems in a number of areas once regarded as "men's business".

Phase 5: The women started to consider solutions for existing ecological problems.

RESULTS: No use of data analysis was attempted in this study. The main finding of the study indicated that the "feminine" side of the ecology movement succeeded in moving from environmental consciousness to environmental action in a practical way.

REFERENCES: 23 cited

177. Sandman, P., Sachsman, D., Greenberg, M., & Gochfeld, M. (1987).

Environmental Risk and the Press (Phase 1). NJ :Transaction Books. 149pp.

DESCRIPTORS: Issue investigation and evaluation skills, descriptive research, attitudes, case study, content analysis, expert analysis

VARIABLES: Article type, source, risk approach, risk category, reporters' attitudes.

PURPOSE: To explore the strengths and weaknesses of environmental risk reporting by using New Jersey's best environmental risk stories as a case study.

SUBJECTS: Editors from the 26 daily newspapers in New Jersey were invited to choose, in their opinion, 5 of the best articles or series of articles concerning environmental risk from their newspaper. Each article within a series was treated as an individual story. All 26 papers submitted articles. A total of 248 individual articles were submitted and then were compiled into an archive for this study.

RESEARCH DESIGN: The analysis of the archive consisted of a formal content analysis and an expert analysis. The formal content analysis coding scheme was designed and pretested. Each article was coded on risk content and assessment of the source. Individuals who were novices in the field, were asked to rate each article according to this coding system. Intercoder reliability was 81%. Expert analysis was performed by a journalist, an environmental activist, an industry representative and a scientist all recognized as experts in their fields, respectively. The panel read each article and members were asked to comment on a list of proposed standards.

RESULTS: The results of phase one reported (1) that there was little information about environmental risk in those articles reviewed; (2) when environmental risk was reported, it tended to be more alarming than reassuring; (3) risk information came mainly from government, industry, and unattributed sources; (4) reporting on environmental risk was presented toward the extreme rather than an intermediate position; (5) bias occurred when reporters relied too heavily on a particular source.

REFERENCES: None cited. For more information on this project,write Environmental Risk Reporting, Department of Journalism and Mass Media, Rutgers-The State University of New Jersey, New Brunswick, NJ 08903.

178. Sandman, p., Sachsman, D., Greenberg, M., & Gochfeld, M. (1987). Environmental Risk and the Press (Phase 2). NJ :Transaction Books. 149pp.

DESCRIPTORS: Issue investigation and evaluation skills, descriptive research attitudes, case study, and content analysis

VARIABLES: Mail survey respondents' attitudes, and telephone survey respondents' attitudes.

PURPOSE: Based on findings of Phase I, the following purposes were identified. To identify the reasons why more environmental risk information is not getting into news stories about hazardous substances, especially first-day breaking stories and to evaluate a series of options for providing environmental risk information to reporters and, thereby, to the public.

SUBJECTS: Environmental reporters at each of the 26 daily newspapers in New Jersey, industry representatives, local health officers, emergency response personnel, environmental activists, academic scientists and government representatives.

RESEARCH DESIGN: Telephone interviews were conducted with reporters at each of the 26 daily newspapers and this was followed by an in-depth mail survey. A participant survey was distributed at the project's Environmental Risk Reporting Symposium conducted on October 4, 1985 at the University of Medicine and Dentistry of New Jersey. Interviews were also conducted with industry representatives, local health officers, emergency response personnel, environmental activists, academic scientists and government representatives.

RESULTS: Results of phase two included (1) reporters do not perceive a great need for background risk information in breaking stories about hazardous environmental situations; (2) when reporters did include risk information, it was the most basic information which concerned threats to human health; (3) in some cases, reporters had trouble finding risk information, but find have little trouble finding the small amount which they desire for their breaking stories and reporters' main complaint about access to information pertained to results of tests that were no available in time for the first-day story; (4) reporters desired risk information chiefly from official, preferably government sources.

REFERENCES: None cited. For more information on this project, write Environmental Risk Reporting, Department of Journalism and Mass Media, Rutgers-The State University of New Jersey, New Brunswick, NJ 08903.

179. Schoenfeld, A. (1981). Newspersons and the environment today. Journalism Quarterly, 57(3), 456-62.

DESCRIPTORS: Model building; ethnographic research

DEPENDENT VARIABLES: State of the art of environmental journalism.

INDEPENDENT VARIABLES: Journalist or newsperson.

PURPOSE: To ascertain where journalists who report on the environmental issues see themselves in relationship to the environment and journalism.

SUBJECTS: A list of environmental journalists was compiled in 1970 and published in Editor and Publisher. This list was used as a starting point for the 1978 study. With the absorption or some papers, the original 107 on the list was down to 69.

RESEARCH DESIGN: The 69 journalists were sent letters asking for their opinion on the state ot the art of environmental journalism. This ethnographic survey was then compiled into several categories for the study. Schoenfeld received 31 replies and an additional 10 views were obtained in interviews.

RESULTS: Most of the original 107 reporters from 1970 have moved on to other papers or positions due to the mobility of journalists, leaving very few veterans. Most of the veterans who remain have a background that includes science. Most of the new recruits come from courts-public affairs-government assignments. Several themes emerge from the comments made by the journalists. Most environmental news items do not fit any of the "beats" found in publications so these news items are generally considered to not be newsworthy. Most of the reporters are objective with high expertise and tend to be neutral on environmental concerns. Most feel that the state of environmental journalism is better in 1978 than it was in 1970.

REFERENCES: 39 cited

180. Schwaab, K. (1982-83). Instructional methods: Their use and effectiveness in environmental education. Journal of Environmental Education, 20(2), 8-12.

DESCRIPTORS: Issue investigation, higher education, affective, descriptive research, program evaluation, ecology education

VARIABLES: Teacher backgrounds, learning methods and effectiveness of teaching methods.

PURPOSE: To obtain additional information to add to the limited base regarding teaching strategies used in environmental education.

SUBJECTS: The instrument was mailed to 296 subjects who were involved with an environmental education curriculum. There were 117 respondents (40%) representing 89 public school systems in Illinois.

RESEARCH DESIGN: Descriptive research utilizing a survey instrument developed to rate the extent of use and effectiveness of environmental education methods by public school educators in Illinois.

RESULTS: A Likert Scale was used for rating the effectiveness of methods. A scale ranging from a minimum of 2 to a maximum of 6 was utilized to rate the effectiveness. The lecture method was most often utilized, but considered to be the least effective. Higher effective ratings were given to the inquiry method, debates, simulations, field trips, and student prepared exhibits, displays, and bulletin boards, displays and exhibits. The implications were that a problem seems to exist in dissemination of the curricular material. Future studies should determine if conclusions reached are valid in other regions and whether or not identified trends are stable or in the process of changing.

REFERENCES: 12 cited

181. Sheppard, B. H., Hartwick, J., & Warshaw, P. R. (1988). The theory of reasoned action: A meta-analysis of past research with recommendations for modifications and future research. The Journal of Consumer Research, 15(3), 325-343.

DESCRIPTORS: Citizenship action, model building, synthesis of research (meta-analysis), attitudes, behaviors, verbal commitment

INDEPENDENT VARIABLES: Attitudes, intentions, subjective norms.

DEPENDENT VARIABLES: Behavior, intentions.

PURPOSE: To assess the degree to which research utilizing Fishbein And Ajzen's model of reasoned action has gone beyond the intended conditions of the model and to determine the empirical implications of failing to meet the model's paramaters. Ten hypotheses were tested.

SUBJECTS: The original sample consisted of 87 separate studies dealing with the model which were published in nine selected journals. Studies were subsequently rejected based on five criteria related to availability of needed data and presence of a clear test of the relationships of interest.

RESEARCH DESIGN: A meta-analysis was conducted. Classification of studies into categories was done by the authors and an assistant; reliability coefficient was listed. Two relationships were tested: (1) attitude and subjective norms to intention, and (2) intentions to behavior.

RESULTS: Statistical analyses included correlation coefficients, analysis of variance, and analysis of variance due to sampling error. These were then subjected to a method of meta-analysis described in earlier research. Alpha level was 0.01. A moderate positive correlation was found between intention and behavior; a moderately high positive correlation was found between intention plus subjective norms and behavior. It was concluded that the Fishbein-Ajzen model has not been used the way it was originally intended. Moderators of the intention-behavior relationships included: (1) how intention was measured, (2) whether or not the dependent variable was a behavior or a goal, and (3) whether or not there was a choice of alternatives. Implications for further research were described.

REFERENCES: 88 cited

182. Shepard, C., & Speelman, L. (1985/1986). Affecting environmental attitudes through outdoor education. Journal of Environmental Education, 17(2), 20-23.

DESCRIPTORS: Ecology Education, elementary, affective, quasi-experimental, outdoor education, rural, urban, attitude and science education

VARIABLES: Environmental attitudes, outdoor education instruction

PURPOSE: The purpose of this study was to determine whether or not any measurable impact on environmental attitudes occurred as a result of participation in a specific outdoor education program.

SUBJECTS: The total number of subjects was 613 children (aged between 9 and 14 years) who attended a summer camp season at 4-H Camp Whitewood, Windsor, Ohio. The experimental group consisted of 405 campers who selected the outdoor education program as one of their options while the control group consisted of 208 campers who did not select outdoor education as their option. The subjects were rural and urban residents.

RESEARCH DESIGN: A quasi-experimental/Solomon 4 group experimental design was used during the study. The instrument used was a Likert-type survey and consisted of 19 questions. That instrument was in the form of a survey and was developed by the researchers by choosing sample questions from several existing instruments. Then these questions were adapted to the specific objectives of the outdoor education program. Moreover, the survey included a series of demographic information. The pretest-posttest was given to the experimental and control groups. The experimental group participated in an outdoor education program while the control group participated in other types of activities related to the wildlife. The validity and reliability of the instrument were not reported.

RESULTS: Responses to the individual items for each survey were entered into the WYLBUR computer system. The Analysis of Variance test (ANOVA) was computed between the various test groups. Various t-tests were computed for pretest and posttest scores of different demographic groups within the samples. The alpha level was set at 0.05. The main findings of the study revealed that the outdoor education program had little effect upon developing positive environmental attitudes among the subject of the study. Meanwhile, the program length had an effect on developing positive environmental attitudes among those subjects. The researchers recommended further studies to be done about the relationship between resident camp experiences and attitude change.

REFERENCES: 11 cited

183. Sia, A., Hungerford, H., & Tomera, A. (1985). Selected predictors of responsible environmental behavior: An analysis. Journal of Environmental Education, 17(2), 31-40.

DESCRIPTORS: Citizenship action, descriptive research, interdisciplinary, environmental sensitivity, behavior, knowledge, affective, locus of control

VARIABLES: A behavior score generated by the behavior inventory of environmental action was the criterion variable. The eight predictor variables were environmental sensitivity, perceived knowledge of environmental action strategies, perceived skill in using environmental action strategies, psychological sex role classification, individual locus of control, group locus of control, attitude toward pollution and attitude toward technology.

PURPOSE: To determine the relative strength of eight predictor variables in predicting responsible environmental behavior and to ascertain the most parsimonious set of variables that predict environmental behavior.

SUBJECTS: Adults ranging from 35 to over 60 years of age from Illinois and Wisconsin who were members of either the Sierra Club or Elderhostels. Most respondents were college educated and from medium size communities. Total n=171.

RESEARCH DESIGN: Respondents completed a sixteen page, seven section instrument. Sections of the instrument included measures of (1) demographic data, (2) behavioral inventory of environmental action, (3) level of environmental sensitivity, (4) environmental action knowledge and skills levels, (5) individual and group locus of control, (6) personal attributes questionnaire and (7) pollution and technology questionnaire. Statistical analysis of survey results were carried out. Content validity is discussed and test-retest reliability of individual sections of the instrument were reported.

RESULTS: Descriptive statistics were utilized on all data. Behavioral scores of all respondents were pooled and were classified as low, medium or high. ANOVA, multiple regression, intercorrelation and stepwise regression statistical techniques were used. All the predictor variables except attitude towards technology were found to be statistically significant ($p<.05$). Perceived skill in using environmental action strategies, level of environmental sensitivity and perceived knowledge of environmental action strategies were found to be the best predictors of overt responsible environmental behavior. The results imply these areas need to be strongly addressed in curriculum development.

REFERENCES: 30 cited

184. Simmons, D. (1984). Community involvement in hazardous waste management: A comparison of an on-site visit and a simulated slide visit. Journal of Environmental Education, 15(3), 25-32.

DESCRIPTORS: Descriptive research, continuing education, cognitive, affective, program evaluation, fieldtrips, simulations

VARIABLES: Attitudes toward hazardous waste management, knowledge of hazardous waste management techniques, on-site visit, simulated slide visit.

PURPOSE: To compare the effectiveness of two presentation methods on hazardous waste management: an on-site visit and a simulated (slide) visit.

SUBJECTS: Seventy-four (74) people registered for a one day workshop offered on two different days concerning hazardous waste management. Participants were unaware of the differences between the two sessions and chose which day they would attend based on scheduling considerations.

RESEARCH DESIGN: A descriptive design using a series of questionnaires composed of two sections. A section consisting of 43 Likert-type items measured the participants attitudes toward hazardous waste management. In a separate section, a group of multiple choice and fill-in-the-blank questions measured knowledge about hazardous waste management. Three questionnaires were given to each participant as a pretest, posttest, and a follow-up three months later. Validity estimates were not given.

RESULTS: The results of the pretest were analyzed using factor analysis to reduce the data into a smaller number of variables. T-tests and ANCOVA were used. Results of the attitude section of the pretest and posttest between and within the two groups indicate that, although there were some significant attitude changes, the overall pattern of change was similar. Significant differences in attitude changes between the follow-up questionnaire and the pretest and posttest were not found. Results of the knowledge section found that participants performed significantly better on the posttest compared to the pretest. No significant differences between the two sessions were found on the posttest scores. In another comparison, participants with technical occupations were found to have significantly different attitudes on four of the nine hazardous waste management factors than participants with non-technical occupations. Results indicate that both methods of presentation provided concrete, vivid imagery of hazardous waste management facilities.

REFERENCES: 9 cited

185. Simmons, D. (1987-88). Communicating with the public: An examination of national park planning workbooks. Journal of Environmental Education, 19(2), 9-16.

DESCRIPTORS: Continuing education, program evaluation, descriptive research, individualized instruction, non-formal, preferences

VARIABLES: The way in which information is communicated; the degree to which information is truly useable to the public; the degree to which participation is possible.

PURPOSE: To examine and evaluate National Park Planning Workbooks from 6 national parks in the United States in order to help the reader better utilize the information presented.

SUBJECTS: A total of 72 volunteers taken from various public areas who were similar to those who might request a workbook or respond to an attempt by the national parks to gain input.

RESEARCH DESIGN: The subjects reviewed planning workbooks from 6 national parks. Each subject was randomly assigned 2 workbooks to review. The subjects were asked to rank order the first 4 elements of the workbooks they found to be most helpful in understanding the workbooks. The subjects also filled out a 31 item questionnaire designed to assess the helpfulness of various elements of each workbook.

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RESULTS: No reliability or validity statistics were given. The main findings were:

1.Workbooks should be divided into visually distinctive, manageable chunks. Maps, headings, lines, boxes, blank space, and bold changes in typeface can all be used to visually separate and distinguish pieces of information.

2.In gaining an overview of the information, the participants preferred elements that could stand on their own, independent from the rest of the material.

3. An in-depth review of the workbook material is aided by providing a visually apparent internal structure or format.

4. During in-depth review, participants utilize a variety of information presented in maps, paragraph descriptions, the alternatives chart, etc. The linkages among these sets of information becomes particularly important for comprehension.

REFERENCES: 9 cited

186. Simmons, D. (1987-88). The teacher's perspective of the resident environmental education experiment. The Journal of Environmental Education, 19(2), 35-42.

DESCRIPTORS: Community/regional resources, program development, descriptive research, outdoor education, attitudes, personal responsibility, environmental education, non-formal

VARIABLES: The views of teachers participating in a resident environmental education program.

PURPOSE: The study examined teachers' perspectives on a variety of subjects in relation to their participation in a resident environmental education program. It also attempted to identify their present needs and attitudes concerning environmental education in their classrooms.

SUBJECTS: The study consisted of responses to questionnaires distributed to teachers at the New Jersey School of Conservation in the Spring of 1986. Of the 100 questionnaires distributed, 72 teachers responded.

RESEARCH DESIGN: The descriptive research involved collecting the views of the teachers participating in the resident program by means of a questionnaire consisting of a five-point Likert-type scale (1 being a negative response and 5 a positive response). The resident environmental education program lasted 3-5 days and involved about 8,000 students and 2,000 teachers. Grade levels ranged from third-graders to preservice teacher-training students. The teachers from established programs were expected to teach most of the classes which were mostly field oriented, outdoor classes. The questionnaire asked the teachers' perspectives in areas such as the need for environmental education, how they benefited from the resident program, the disadvantages of the program, and their support and training needs. No reliability or validity was reported for the questionnaire.

RESULTS: The responses were analyzed using factor analysis. The data were reduced into smaller sections by grouping questions into sets comprised of similar ideas. Questions dealing with the attitudes toward environmental education were broken into three factors. The "Importance of EE" had a mean of 4.2, reflecting a sense that teachers felt EE was a vital part of the curriculum. "Disruption of EE" (mean = 1.3) also showed favorable attitudes toward the importance of environmental education. Another group of questions were broken into three factors dealing with the preceived benefits of participation. The factors were "Nature/enjoyment" (mean 4.5), Social/self (mean = 4.3), and "challenge" (mean = 4.2). Among perceived drawbacks, the only factor of some concern was being away from responsibilities (mean = 2.0). Teachers also expressed a desire to be able to teach part of the program (mean = 3.9). Some differences among background variables were noted.

REFERENCES: 11 cited

187. Singer,Eleanor and Endreny, Phyllis. (1987). "Reporting hazards: Their benefits and costs." Journal of Communications, 37(3), 10-26.

VARIABLES: Media reporting on hazards

PURPOSE: To determine what kind and how much information the media provide about risks and benefits for various kinds of hazards and whether this information varies according to the type of medium.

SUBJECTS: 15 media outlets were systematically monitored from September 1 to December 31, 1984. For comparative purposes, four weeks in 1960 were also analyzed. The media were selected to provide a sampling of national newspapers, news magazine, and television coverage as well as purposely planned comparisons with selected local media and media aimed at specialized audiences. During the sample periods, every story dealing with hazard or group of hazards was selected for analysis. A smaller random sample of 1,276 stories was selected for detailed analysis.

RESEARCH DESIGN: For the content analysis, each story selected was assigned to one of six categories: 1)natural hazards, 2)activities involving benefits and costs, 3)energy hazards, 4)material hazards, 5)complex technologies, and 6)illness. Each story was coded by one of six coders and then edited by another coder.

RESULTS: Findings indicate that the media emphasize hazards that are relatively serious and relatively rare, with the combination giving them "news value." The media do not report on risks but they report on harms, and although actual or potential harms are almost always mentioned, information about benefits is rarely reported.There were no significant differences between the 1984 and 160 samples.In conclusion, the information provided by the media about risks is inadequate and fails to put the risks in perspective.

REFERENCES: 28 cited

189. Stapp, W., Cox, D., Zeph, P., & Zimbelman, K. (1983). The development, implementation, and evaluation of a transportation curriculum module for middle school-aged youth. Journal of Environmental Education, 14(3), 3-12.

DESCRIPTORS: Middle/junior high school, economic background, program development, program evaluation, program implementation, issue awareness/knowledge of issues, citizenship action, values clarification

INDEPENDENT VARIABLE: Model curriculum.

DEPENDENT VARIABLE: Transportation awareness and knowledge.

PURPOSE: To develop a model curriculum for middle school youth focused on community and global transportation problems; to implement a pilot study of the curriculum; to determine if any shifts occurred in the learners' attitudes, knowledge, values and skills as a result of the curriculum.

SUBJECTS: Two seventh grade and one sixth grade classes in a middle class suburban Detroit school system volunteered and were selected as subjects. A fourth class (seventh grade) from the same school system was selected as a control group. All classes were heterogeneous mixture of abilities and backgrounds. Experimental n=78. Control n=22.
The participating teachers (one social studies and two science) were given an orientation to the modules by the developers. The modules were taught 50 minutes each day for five to six weeks.

RESEARCH DESIGN: The instructional materials were divided into five modules: 1.) how learners and others travel, 2.) the implications of these travel patterns, 3.) identification and potential solutions to transportation problems in the learners community, 4.) how people travel in other parts of the world, 5.) the identification of a specific transportation problem in the learner's community and working toward a solution. The participating teachers were given an orientation to the modules by the developers. The modules were taught 50 minutes each day for five to six weeks. A pre-posttest instrument was used to determine if any shifts occurred int he dependent variables. All instruments were pretested prior to the study. No threats to reliability or validity are discussed.

RESULTS: Student's T-test and Fisher's Exact Analysis were used. Statistically significant shifts were found in the experimental groups' attitudes, values and skills. Alpha ranges from .0456 to .0001 were reported. The researchers identified specific areas which changed.

REFERENCES: 0 cited

190. Stout-Wiegand, N. & Trent, R. (1984). Comparison of students' and non-student residents' attitudes toward local energy developments: Environmentalism versus economic interests. Journal of Environmental Education, 16(1), 29-35.

DESCRIPTORS: Descriptive research, attitudes, educational background, higher education

INDEPENDENT VARIABLES: Type of residency (permanent vs. temporary student).

DEPENDENT VARIABLES: Attitude towards the environment, attitude towards proposed local energy related developments.

PURPOSE: To examine differences between permanent residents and university students in a small Appalachian city with respect to their attitudes toward the environment and toward local energy related developments.

SUBJECTS: Beginning with a sample size of 1740, respondents were contacted by telephone using the random digit dialing method. 1165 successful contacts were made, and 705 persons agreed to the interview(61% response rate). The ratio of students to townspeople in the sample was expected to approximate the true population ratio, though confirmation of this was not noted.

RESEARCH DESIGN: Both open- and closed-ended questions were asked of respondents by eleven trained interviewers. 83 questions were asked of townspeople participating in the survey, while a short form of 24 questions was asked to students. Reason for this difference was not noted.

RESULTS: Chi square was used to test for statistical significance (alpha level = .05). Two hypotheses were looked at. 1.) University students would not be more pro-environment than non-student residents. 2.) Non-student residents would be more favorable toward local energy developments than would university students. Both of these were supported by the data. Findings in support of the second hypothesis may be due to non-student residents seeing such projects as economically beneficial on the other hand, resident students, who are a transient population, have no vested interest in the development or completion of such projects. Future researchers are urged to differentiate between how people feel about industry and the environment in general, from how they feel about industry and environment in their own community. The authors feel the extent of an individual's ties to the local community can substantially influence their expressed opinions.

REFERENCES: 25 cited

191. Strickland, M., Robertson, E., Jettinghoff, C., Diener, C. (1984). Pretest and posttest comparisons of preschool children's knowledge about energy. Journal of Environmental Education, 15(2), 32-25.

DESCRIPTORS: Cognitive, issue awareness/knowledge of issues, program development, games, action learning, non-formal, energy education

VARIABLES: Predictor: An energy education program consisting of three weeks of learning activities. Criterion: The energy information possessed by 3, 4, & 5 year olds according to a Preschool test of Energy Information.

PURPOSE: The objective of the study was to discover the effects of an energy education program on the information that preschool children have related to energy.

SUBJECTS: Subjects included preschool children enrolled in The Alabama Child Development Laboratory; a total of 47 children.

RESEARCH DESIGN: A pre-experimental, pretest-posttest design was used in the study. The instrument was developed by the researchers and contained 42 items with pictures and objects for children to identify as the subjects were given the tests individually. A statistician was consulted relating to test format and validity. A reliability coefficient of .86 was reported. A pretest was administered by trained graduate students. The treatment period was three weeks and included games and learning activities related to energy use. Posttests were administered by the same graduate students. Data were subjected to ANOVA with interaction of age an sex determined along with pre and posttest differences.

RESULTS: Results showed significant improvement on the mean posttest for the whole group. ($p<0.01$) There were no significant interactions between age, sex, and change of scores from the pretest to the posttest which did not support the hypothesis that the older children would score significantly higher than the younger children before and after the program. Results showed no significant differences in the score improvements between boys and girls at the 0.05 level. The research implies that preschool children do profit from the energy education program. Further research suggested would be the exploration of retained knowledge and how the information effects the behavior of the children at home.

REFERENCES: 8 cited

192. Tanner, T. (1984-1985). The evolution of EE as inferred from citation analysis. Journal of Environmental Education, 16(2), 20-29.

DESCRIPTORS: Descriptive research, behavior, preferences, cognitive, affective, knowledge

VARIABLE: Citation behavior of authors in Journal of Environmental Education and Current Issues in Environmental Education and Environmental Studies for the years 1976-1983.

PURPOSE: To describe the evolution of EE as it relates to changes in citation behavior in two core publications, Journal of Environmental Education and Current Issues in Environmental Education and Environmental Studies.

SUBJECTS: N/A.

RESEARCH DESIGN: Citation analysis was used to determine changes in authors' citation behavior. The researcher tallied the number of articles and citations in The Journal of Environmental Education and Current Issues in Environmental Education and Environmental Studies for the years 1976-1983. Articles without citations and repeated citations such as ibid., op cit., and loc cit. were tallied. Special methods were developed for dealing with citations to co-authored articles. Once the citees were identified, a tally was made to determine the most-cited citee. A weighted count was assigned to a citee based on his/her contribution. Each citee was then classified into one of five topical categories: environmental societal foundations, psychological-pedagogical foundations, environmental education, sociology, and mass communication and journalism. The final list was compared to one for 1969-1974.

RESULTS: Chi-square analysis and Kruskal-Wallis one-way analysis of variance were used to assess changes in the citation behavior. Significant differences were observed in said behavior when the two lists were compared. The researcher observed the following trends: 1) references to the environmental-societal foundations of EE, which had dominated EE in the earlier years, was replaced by references to psychological-pedagogical foundations and EE in the recent years, 2) considerable references to the research literature of sociology and communications were made in the Journal by authors from these fields, 3) environmental education authors prefer to use the high incidence of collaborative authorship of EE and environmental-societal foundations low incidences. The researcher interpreted the trends as a maturation of the psychological-pedagogical foundations and EE.

REFERENCES: 10 cited

193. Taylor, D. (1988). Environmental education in Jamaica: The gap between policymakers and teachers. Journal of Environmental Education, 20(1), 22-28.

DESCRIPTORS: Teacher education inservice, descriptive research, rural, urban, attitudes, citizenship, science education, secondary

VARIABLES: Teachers' attitudes about including environmental studies in the curriculum, the content of the high school syllabi regarding the environmental material in the curriculum, and the attitudes of the curriculum planners and environmental affairs officers.

PURPOSE: To find out if teachers would support the inclusion of environmental studies in high school curriculum, to examine the high school subject syllabi to see if environmental topics were dealt with and how, and to interview the curriculum planners and environmental affairs officers to see what plans they had for public environmental education.

SUBJECTS: The subjects were 175 teachers chosen from twenty-one schools in Jamaica. Of the 118 teachers who responded, 79 were female, 38 were males, and 1 did not indicate gender. The respondents' age ranged from 21 to 65 years. The second segment of the subjects was the curriculum planners and the environmental affairs officers (n - 4).

RESEARCH DESIGN: A descriptive research design was used. Two instruments were utilized in the study. First, questionnaires were sent to the teachers. The response rate was 67 percent. The second instrument was a formal interview with 4 curriculum planners and the environmental affairs officers. Furthermore, the researcher examined the high school curriculum to see if environmental topics were dealt with and how.

RESULTS: The respondents were asked to rank each question on a scale from 1 to 7: 1 being highly disfavor and 7 being highly favor. Mean scores were computed from the answers of all the respondents. The alpha level was not reported. The main findings of the study were: 1. The Jamaican teachers were highly supportive of the idea of including environmental studies in the high school curriculum. Eighty-nine percent indicated that such studies should be incorporated into existing courses, and 74.3% indicated that they would attend seminars to prepare them to teach such material. 2. The examination of several course syllabi revealed that a large amount of environmental material was already incorporated into the new Caribbean Examination Council course syllabi. 3. The interviews with curriculum planners and policymakers indicated that widespread teacher training and public education workshops were not planned because of lack of j=funding and miscommunication between ministries and departments. The researcher did not cite implications or make recommendations for further studies.

REFERENCES: 19 cited

194. Thompson, J., & Gasteiger, E. (1985). Environmental attitude survey of university students: 1971 vs. 1981. *Journal of Environmental Education*, *17*(1), 13-22.

DESCRIPTORS: Environmental sensitivity, attitudes, values, descriptive research, economic background, higher education, affective, beliefs

VARIABLES: College students' attitudes toward environmental and energy issues.

PURPOSE: To measure changes in environmental attitudes, over a ten year period, toward thirty-five specific items in five major categories (foodstuffs, household items, transportation, personal items, and recreation).

SUBJECTS: Three thousand four-hundred-fourteen (3,414) Cornell University students enrolled during 1971, and 3,867 Cornell University students enrolled during 1981.

RESEARCH DESIGN: A descriptive research design.utilizing a questionnaire of environmental attitudes of university students in 1971 to those of university students in 1981. The questionnaire included 4 parts. The first part was designed to assess students' awareness of environmental/energy problems. The second part used a Likert-type scale to quantify participants' willingness to give up specific consumer goods and services. The third part used a Likert-type scale to measure participants' responses to "possible control measures," i.e., rationing use of electricity. The fourth part collected demographics on the participants.

RESULTS: Paired t-tests and analysis of variance were used to analyze the data. Significant differences were observed between the two surveys. The 1981 participants were significantly less willing to give up consumer items than were the 1971 participants. Most of the differences were due to political leanings, income, gender and geographical backgrounds. The author concluded that the changes were in the direction of a more materialist lifestyle with less consideration for environmental/energy issues and concerns.

REFERENCES: 11 cited

195. Trent, J., (1983). Environmental education in our schools during the 1970s. Journal of Environmental Education. 15(1), 11-15.

DESCRIPTORS: Program Evaluation, descriptive research, and science education

VARIABLES: Various aspects of environmental education as reported by teacher education institutions and state departments of education.

PURPOSE: The purpose of this study was to assess what type of education was favored by universities and state departments of education. Moreover, this study attempted to describe the status of environmental education in the 1970s.

SUBJECTS: The subjects of the study were 700 teachers institutions randomly selected from the Yearbook of the American Association of Colleges of Teacher Education. Moreover, all the 50 state Departments of Education participated in the present study.

RESEARCH DESIGN: A descriptive survey design was used. The same questionnaires were sent in 1972 and again in 1979 to the same participants of the study. The response rate was at least 70 percent. The questionnaires sent to the teacher institutions were different from those sent to the state departments of education. The researcher himself developed the questionnaires but their validity and reliability were not reported.

RESULTS: A chi-square calculation was run on each question for which data were available for both 1972 and 1979. The alpha level chosen was 0.05. Various probability levels were reported. The main findings of the study indicated that:

(a).Progress was made between 1972 and 1979 in most areas of environmental education.

(b).An analysis of the returns from teacher training institutions showed a significant increase in number of colleges offering environmental education in the period 1972-1979. Moreover, the number of colleges having teaching minors in environmental education had increased significantly in that period.

(c).An analysis of the returns from State Departments of Education indicated a significant increase in states having coordinators of environmental education. The number of workshops in environmental education financed by states had also increased in the 1972-1979 period.

Educational implications and research recommendations were not reported in this study.

REFERENCES: None cited

196. Vander Stoep, Gail A. & James H. Gramann. The effect of verbal appeals and incentives on depreciative behavior among youthful park visitors. Journal of Leisure Research, 19(2), 69-83.

DESCRIPTORS: outdoor classrooms, environmental/nature centers, museums, experimental research, resource management education, behaviors

INDEPENDENT VARIABLES: 4 messages delivered to groups before starting their hike -

a. "Awareness of Consequences" treatment - verbal information about the damaging consequences of specific acts (AC Treatment)

b. "Awareness of Consequences plus Resource Protector" treatment - AC treatment plus hikers asked to record any damage to resources they noticed while in the park (AC + RP Treatment)

c. "Awareness of Consequences plus Resource Protector plus Incentive" treatment - AC + RP plus hikers an incentive of an award given to hikers (AC + RP + I Treatment)

d. Control group - hikers met at trailhead and just welcomed

DEPENDENT VARIABLES: "Depreciative behaviors" -

a. sitting on the base of the monument

b. leaning on, touching or rubbing a monument or cannon

c. striking, climbing, and sitting that required climbing

PURPOSE: To determine the effects of three personally-delivered messages on the amount of "depreciative behavior" committed by youth groups hiking the park's trails.

SUBJECTS: Youth groups, primarily boy scouts were used in 3 randomly assigned treatment groups with one control group. Final sample size: AC Treatment, n = 42 groups; AC + RP Treatment, n = 39 groups; AC + RP + I Treatment, n = 53 groups; Control, n = 72 groups.

RESEARCH DESIGN: A posttest only control group design was used. Hiking groups were met near trailhead and given a scheduled treatment message or just welcomed under control condition. Each hiker in control or treatment group was given a bright orange sticker which help identify them to film analysts. Time lapse movie cameras were positioned in trees at four sites which were to be monitored. Cameras set to expose one frame of film every four seconds. Two trained film analysts (both blind to treatments) independently analyzed film. Counted number of frames in which three dependent variables occurred.

Validity procedures/estimates were not listed. Correlation coefficients between two film analysts' scores at each of the four site were calculated across all behaviors as follows:

Site 1, r = .947
Site 2, r = .996

Site 3, r = .998
site 4, r = .937

RESULTS: All treatments reduced depreciative behavior relative to the control condition. AC and AC + RP treatments reduced climbing/ hitting activity by 88%. AC + RP + I treatment reduced climbing/ hitting by 87%. Leaning/touching behaviors, although reduced, were not affected as much as were the more serious behaviors (i.e. climbing/ hitting). Under the AC + RP + I treatment leaning/ touching increased slightly, although not significant statistically.

The AC + RP and AC + RP + I treatments did not differ significantly from each other in their impact on depreciative behavior.

REFERENCES: 23 cited

197. VanLiere, Kent D., & Dunlap, Riley E. (1980). The social bases of environmental concern: A review of hypothesis, explanations and empirical evidence. Public Opinion Quarterly, 44(2) 181-97.

DESCRIPTORS: Issue awareness/knowledge of issues, community resources, hypothesis generation, secondary analysis

PURPOSE: To determine more precisely what is known about the correlates of environmental concern.

RESEARCH DESIGN: Five popular hypotheses (Age, Social Class, Residence, Political, and Sex) asserting relationships between environmental concern and eight demographic and social variables were reviewed, with particular attention paid to the theorectical explanations offered in support of each hypothesized relationship. Additionally, the results of 21 relevant studies were evaluated to determine the degree to which the empirical evidence supported the hypothesized relationships.

RESULTS: The review of evidence on the social correlates of environmental concern suggests that only three of the hypothesized relationships (Age, Education, and Political Ideology) should be considered empirical generalizations. Consequently, it can be confidently concluded that young, well-educated, and politically liberal persons tend to be more concerned about environmental quality than older, less educated, politically conservative indiviudals.

REFERENCES: 43 cited

198. Verhallen, Theo M., and W. Fred Van Raaij. (1981). "Household Behavior and the Use of Natural Gas for Home Heating" Journal of Consumer Research, 8, pp. 253-257.

DESCRIPTORS: Descriptive research, investigation, attitudes, behaviors, and energy education

INDEPENDENT VARIABLES: Home characteristics, household behavior, attitudes, special circumstances (number of bedrooms used, absence during weekends or working hours), energy use, sociodemographics (household income, education level, ages, occupational level of husband)

DEPENDENT VARIABLE: Energy use.

PURPOSE: To investigate the relationships between energy-related attitudes, household behavior, home characteristics, sociodemographics, and the actual use of natural gas for home heating.

SUBJECTS: The home central heating system was monitored for 145 households in Vlaardingen, Holy-North, The Netherlands from November 1976 through November 1977. In Holy-North, one firm built 157 similar row houses: 79 with standard insulation and 78 with superior insulation. The design of these houses are similar with the exception of insulation, wind orientation, and positioning in relation to neighbors. Those houses attached on both sides to other houses tend to lose less heat. All have central heating systems, using natural gas to heat water pumped through radiators.

RESEARCH DESIGN: In the first stage of this study, one respondent (usually the wife) was asked to respond to eight statements pertaining to their attitudes toward home temperature, ecological concerns, and energy and price consciousness. After a principal-components analysis, three factors explained 62 percent of the variance: energy consciousness, home comfort, and price consciousness.

For household behaviors, participants reported 17 types of energy-related behaviors. After a factor analysis, six factors explained 58% of the variance: bedroom temperature at night, home temperature during absence, home temperature during presence, use of curtains, airing out rooms, and use of bedrooms.

No significant differences were determined on sociodemographic variables between households with standard insulation and those with superior insulation. Also, natural gas meters were read four times during the study. Homes with superior insulation used less energy.

RESULTS: The variables listed above are responsible for 58% of the energy use variance. However, if regressed separately, household behavior accounts for 26%, home characteristics 24%, and special circumstances 11%. In this study, attitudes were poor predictors of household behaviors. In addition, the positive effect of home insulation is a lower thermostat setting while a negative effect is the frequent airing out of rooms. The benefits are still greater for having insulation, so it is still promoted.

REFERENCES: 6 cited

199. Vlahov, S. J. & Treagust, D. (1988) Students' knowledge of energy and attitudes to energy conservation. School Science and Mathematics, 88(6), 452-458.

DESCRIPTORS: Issue awareness/knowledge of issues, secondary, cognitive, affective, descriptive research, energy education, attitudes

VARIABLES: Knowledge of energy, attitude toward energy conservation, achievement levels of students, and gender.

PURPOSE: To provide information about the adequacy of knowledge of energy and attitudes toward energy conservation in a group of students who had just completed ten years of schooling without any specific curricular emphasis in energy education.

SUBJECTS: The student sample consisted to 333 grade 10 students, equally divided by gender, drawn from three large metropolitan senior high schools in Australia.

RESEARCH DESIGN: Knowledge of energy and attitude toward energy conservation instruments were developed for this study and administered to the subjects. Cronbach alpha reliabilities for the scales were reported for the three subscales of the attitude instrument were 0.82, 0.49, and 0.79. Kunder-Richardson 20 reliabilities for the knowledge instrument were .77 and .78 for the two forms of the instrument. Results were obtained on the knowledge and attitude instruments for the three levels of student achievement and according to sex.

RESULTS: Males had more positive attitudes toward energy conservation than did females. Males also had more positive attitudes toward energy and energy conservation than did females. Students in the higher achievement levels had a more positive attitude toward energy conservation than did the next highest achievement level. There was a high correlation between attitude subscale scores and student knowledge of energy and energy conservation scores. The authors concluded that energy and energy education need to be emphasized equally in the curriculum for students of both sexes and all ability levels.

REFERENCES: 11 cited

200. Volk, Trudi L. (1984). Project synthesis and environmental education. Science Education, 68(1), 23-33.

DESCRIPTORS: Elementary, secondary, program evaluation, ex post facto research, descriptive research, case study, science education

PURPOSE: To determine the current status elementary and secondary school science education in the United States and to make recommendations for the future.

VARIABLES: N/A.

SUBJECTS: N/A.

RESEARCH DESIGN: A nationwide team of science educators reviewed four comprehensive studies: one that summarized science education literature between 1957-1975; one that collected information about practitioners' use of materials, practices and leadership in science education; one that examined case studies and in-depth analysis of several schools; and one that provided information about the science education outcomes for various age groups of school children and adults. The ideal goals of science education were grouped into four 'goal clusters' to help the researchers analyze and interpret the data. These clusters were: personal needs, societal needs, academic preparation, and career education/awareness.

RESULTS: The Project Synthesis staff determined that only the needs for academic preparation were being met effectively, and they recommended a new science curriculum be developed that would place more emphasis on personal and societal concerns. The author of the research discussed the similarities between the goals of environmental education and the goals of the proposed science education curriculum. She suggested that the goals, basic framework, content, and skills of environmental education could be used to develop the proposed curriculum for a new science education program in order to meet the needs of students more effectively.

REFERENCES: 28 cited

201. Volk, T., Hungerford, H., & Tomera, A. (1984). A national survey of curriculum needs as perceived by professional environmental educators. Journal of Environmental Education, 16(1), 10-19.

DESCRIPTORS: Teacher education inservice, descriptive research, formal, non-formal, higher education, elementary, middle/junior high school, secondary

VARIABLES: Perceived importance of EE goal statements, perceived accomplishment of EE goal statements, perceived curricular needs, anticipated use of EE curricula, perceived need for inservice teacher education.

PURPOSE: To assess perceived environmental education curriculum needs in the U.S.

SUBJECTS: Professional educators were randomly selected from the memberships of the National Assn. of Environmental Education and the Conservation Education Assn. Geographically, respondents were widely distributed with 29 states and the District of Columbia represented. The response rate was 58.6% (n = 99).

RESEARCH DESIGN: Data were collected using an instrument, the EECNAQ. This in strument consisted of a set of 15 goal statements adapted from Goals for Curriculum Development in EE. The instrument employed a five-point response scale in addition to a sixth response (to indicate insufficient knowledge to respond). The EECNAQ was validated by a panel of three professional environmental educators. A pilot survey established acceptable internal consistency of the instrument. Each professional educator received a mailed copy of the instrument, a cover letter, a demographic sheet, and a self-addressed stamped envelope. A follow-up questionnaire was mailed to ensure a higher rate of response.

RESULTS: Based on the mean response of the questionnaire items, the researchers concluded that there was a consensus among the professional participants that the EE goals were important ones, that they were not being met to a large extent in existing curricula, that extensive needs existed for both goal-oriented curricula and teacher education, and that the goal-oriented curricula would be used by teachers. Ancillary findings were included. Both educational and research recommendations were discussed.

REFERENCES: 24 cited

202. Wagstaff, M., & Wilson, B. (1988). The evaluation of litter behavior modification in a river environment. Journal of Environmental Education, 20(1), 39-44.

DESCRIPTORS: Environmental sensitivity, outdoor classrooms, psychomotor, experimental research, outdoor education, personal responsibility, behaviors

INDEPENDENT VARIABLE: Verbal appeal and role modeling comprised the treatment intended to prompt letter pick up.

DEPENDENT VARIABLE: The number of litter pieces picked up.

PURPOSE: To measure the effectiveness of verbal appeals and role modeling treatment by observing group behavior in a river environment.

SUBJECTS: Commercial rafting groups floating Idaho's Salmon River constituted the study population. The sample taken from the study population originated from those groups who participated in one of sixteen trips that were designated control or treatment.

RESEARCH DESIGN: A quasi-experimental design was used to test the effects of verbal appeals and role modeling by river guides on litter control. A questionnaire was used to collect demographic and experiential information. Statistical comparisons of the control and treatment groups were conducted to assure that there was no bias associated with the researcher's lack of control over trip assignment. A randomization test for 2 independent samples was used to analyze the data. Alpha level was set at .10.

RESUTLS: Results showed significant differences in letter collection behavior among the treatment and control groups. When role modeling and verbal appeals were used with commercial rafting groups, they appeared to improve litter pick up behavior. Planting designated litter in specific locations proved to be an effective and manageable technique.

REFERENCES: 15 cited

203. Wellman, J.D., Dawson, M.S., & J.W. Roggenbuck. (1982). Park managers' predictions of the motivations of visitors to two national park service area. _Journal of Leisure Research._ 14(1), pp. 1-15.

DESCRIPTORS: Descriptive research, hypothesis generation, environmental sensitivity, attitudes, preferences, and behaviors

VARIABLES: Motivation for visiting parks.

PURPOSE: To compare the expressed motivations of visitors to two National Park Service Units with area managers' predictions of those motivations.

SUBJECTS:

Cape Hatteras: A stratified probability sample of 308 ORV (off-road vehicles) and 290 pedestrians were contacted through a mail back survey from June 1 - Nov. 30, 1978. 41 managers completed separate batteries of motivation items.

Shenandoah: A stratified sample of 329 backcountry visitors (hikers) were contacted at 8 trailheads between July 21 and Oct. 15, 1978. A seven page mailback questionnaire was given to them. 41 managers completed separate batteries of motivation items. There were four treatment groups.

RESEARCH DESIGN: This study is descriptive research in which mailback questionnaires were used. Two treatment groups from Cape Hatteras were asked to indicate the importance of each motivational item in a twelve page questionnaire using a 5-point likert scale. Scores ranged from 1=strongly agree to 5=strongly disagree. The items were factor analyzed with varimax rotation and reduced to 11 scales.

Two treatment groups from Shenandoah were asked to respond to items on a seven page questionnaire. Responses were based on a nine-point scale ranging from 4 = adds most strongly to -4 = detracts most strongly and the neutral point being 0. A hierarchical cluster analysis was used to reduce items to 25 scales.

RESULTS: Analysis of variance and t-tests were used to measure statistical differences. For Cape Hatteras, 16 out of 22 comparisons showed differences between visitors' ratings and managers' predictions that were statistically significant at the .01 level or beyond. The absolute descrepancy of managers predictions of pedestrians was .55 and for orv-users .68 on a five-point scale. It was concluded that managers underestimated the importance to visitors of scenery, in-group contact, and escaping personal/social pressure to visiting Cape Hatteras. Conversely, managers overestimated the importance both visitor groups attached to meeting new people and exercise.

At Shenandoah, 8 out of 25 comparisons were statistically significantly at the .01 level. All 8 of the managers' predictions were underestimates. Thus, managers did very well in predicting their visitors' motivations.

The researchers have concluded that further investigation is needed to observe visitor behavior in recreation settings to test the validity of their expressed preferences. Secondly, attuning managers to visitor motivations should be studied especially those visitors that are removed from the traditional park ideal.

REFERENCES: 31 cited

204. Westphal, J. & Halverson, W. (1985-1986). Assessing the long term effects of an environmental education program: A pragmatic approach. Journal of Environmental Education, 17(2), 26-30.

DESCRIPTORS: Issue awareness/knowledge of issues, citizenship action, continuing education, program evaluation, descriptive research, personal responsibility, STS education.

VARIABLES: Citizenship participation in public decision making precesses affecting Lake Michigan, good up-to-date information on issues concerning Lake Michigan water quality, knowledgeable and informed citizenry concerning Lake Michigan water quality issues.

PURPOSE: To describe a methodology developed to assess the long-term behavioral modifications resulting from environmental education designed to encourage citizen participation and to describe the nature and extent of behavioral changes exhibited by the workshop participants.

SUBJECTS: One hundred nineteen (119) community leaders, decision makers, and interested citizens which attended "Decision for Lake Michigan" workshops. Data were obtained from fifty-one of the subjects.

DESIGN: This descriptive research used a two-page mailed survey. Forty-six (46) were returned. Five of the remainder were contacted and surveyed by telephone. The instrument consisted of fourteen statements operationalized from the three objectives (variables) by one of the authors. A five-point Likert scale was used. Also, five open-ended questions addressed possible behavior changes as a result of the workshop. Validity and reliability procedures and estimates were not given.

RESULTS: Data were analyzed by matching survey questions to the three stated objectives (variables). Levels of significance were not given. Relative to the Interstate Water Quality Project Workshop, the authors data indicate: (1) an increase in public decision making processes by the respondents as a result of the workshop, (2) the course information was viewed as up-to-date, (3) knowledge of issues concerning Lake Michigan water increased. The program appears to be at least partially successful. The authors suggest capitalizing on successful aspects and modifying less affective aspects of the workshop in order to improve future environmental education programs focusing on citizen participation in environmental affairs.

REFERENCES: 10 cited

205. Wilkins, L. and Patterson, P. (1991). Risk analysis and the construction of news. Journal of Communication, 7(3), 80-92.

DESCRIPTORS: issue awareness/knowledge of issues, issue identification and analysis skills, issue investigation and evaluation skills, affective, cognitive, case study, investigation, content analysis, television, print media

PURPOSE: To show that the media coverage of the Bhopal and Chernobyl incidents was not effective in the communication of risk.

SUBJECTS: Media coverage of both the Bhopal and Chernobyl disasters was examined. The analysis of media content of the Bhopal incident coverage covered two months-- from December 3, 1983 to February 3, 1984. The printed material was obtained from the "Nexus" database. All stories with the key words "Bhopal," "Union Carbide," and/or "Institute"(Institute, West Virginia, is the location of Bhopal's sister plant) were chosen. Network television coverage was obtained from the Vanderbilt University Television Archives. The total number of print and broadcast stories was 952. The three major network newscasts' content of the Chernobyl incident coverage during the first month following the incident was also studied. This material, which amounted to six hours and 23 minutes of videotape, was obtained from Vanderbilt archives.

RESEARCH DESIGN: This qualitative study specifically studied the content of media coverage of the Bhopal and Chernobyl disasters. In studying the Bhopal material, the primary thematic foci of the stories were determined by analyzing the emphasis on technical hazards or individual events; as well as background information about long-term health and environmental consequences, technological hazards, and economic and cultural status. Visual content of the television stories was analyzed separately, and key figures were categorized by nationality, occupation, and institutional affiliation as cited by the stories. Seven coders were trained for three weeks, and intercoder reliability rates of .81 for written analysis and .95 for visual analysis were reported. In studying the Chernobyl incident, 85% of the stories' verbal and visual content were coded by a graduate student for sources, story length, place of story in the newscast, mention of risk, visual causes, and other items. A random sample of 15% of the stories were coded by one of the authors of the study. Intercoder reliability measures of .97 for verbal coding and .94 for visual coding were reported. For coverage of both incidents, verbal coding used "hard" analysis, including simple frequencies of discrete and quantifiable variables. Visual coding used "soft" analysis, with coder judgment evaluating news story and context.

RESULTS: The coverage of the Bhopal incident rarely included the larger issues of mitigation and prevention and focused primarily on the disaster and clean up. The television coverage was more event-centered, and did not present Bhopal in the larger framework of technological hazard. Both the written and broadcast media portrayed victims as women and children, and a sense of helplessness prevailed. Television used images of gas emissions and facilities in 68% of the reports. In covering the Chernobyl incident, the networks reported the stereotypical view of Russians and Soviet government as the sociopolitical context. Soviets were portrayed as unintelligent and low-tech, secretive liars, and not caring about the people. The networks, having to rely on graphics, chose to use flashing graphics in 82% of the stories. Overall, the study found one of the fundamental problems in media coverage of risk is the reliance on images to cover the story. News media in these kinds of situations use a dramatic frame for what risk experts view as a primarily technological problem. The author suggests three things which would enable news media to cover incidents of risk more effectively: the media need to cover risky events as political stories with technological underpinnings; information about the political environment should be obtained as early as possible in order to be of the greatest value; and the mass media needs to view the assumption of risk as a series of political decisions rather than one novel event.

REFERENCES: 42 cited

206. Winett, R. A. & Kagel, J. H. (1984). Effects of information presentation format on resource use in field studies. Journal of Consumer Research, 11(2), 655-667.

DESCRIPTORS: Behavior, conservation education, resource management education, energy education, synthesis of research

VARIABLES: Field studies are reviewed regarding antecedent strategies (brochures and booklets, prompts, and modeling) and consequence strategies (feedback and rebates).

PURPOSE: To review recent experimental field studies in resource conservation and to draw conclusions about the effectiveness of particular formats for presenting information.

RESEARCH DESIGN: Authors review experimental field studies in psychological behavior regarding resource conservation, discussing different experimental methodologies used to determine the impact of information flows on behavior. The research of one author (Winett) is highlighted. An outline of the two basic types of strategies used to promote resource conservation (antecedent strategies used to promote resource conservation - antecedent (brochures and booklets, prompts, modeling) and consequence (feedback and rebates) is presented. Reasons why applications of particular procedures succeed or fail are identified. Confounding effects and variables in field studies are accounted for. Future policy applications are discussed.

RESULTS: Effectiveness in reducing resource consumption is apparently the result of the presentation of information about conservation strategies in a clear and precise manner. Of the various media available to planners (audio, print, and video), video is discussed as having most noticeable benefits in reaching specific segments of population. Recommendations for planning information presentation are presented. Information presentation format research is called for. The role of incentives and motivation in planning consumer information is recognized.

REFERENCES: 54 cited

207. Winett, R. A., Leckliter, I. N., Chinn, D. E., & Stahl, B. (1984). Reducing energy consumption: The long-term effects of a single TV program. Journal of Communication, 34(3), 37-51.

DESCRIPTORS: Energy education, quasi-experimental research, behaviors, media based, social research

INDEPENDENT VARIABLES: Contact of a data clerk, intervention of a TV program for prompting energy conservation, and author visiting participants' home.

DEPENDENT VARIABLES: Energy knowledge changes, changes in interior home temperature and humidity after reductions in energy use, strategies adopted by viewers, TV program ratings, and effect of information diffusion by viewers.

PURPOSE: To discover if the intervention of a energy conservation program through a cable TV system's public access channel is effective for the public to adopt strategies of energy conservation encouraged by the program and reduce use of energy.

SUBJECTS: Home owners living in one large, middle-class subdivision of detached homes in Roanoke, Virginia. The subjects had annual income about $30,000 and subscribed to the local cable TV system. The total number of the subjects are 150 , which had different types of household energy system (e.g., gas hear, central air conditioning, window air conditioning units).

RESEARCH DESIGN: A quasi-experimental design was used. The subjects were purposely selected because of their mean of income and assigned to five groups following a stratified random assignment procedure in which type of household energy system was the stratification variable. The five groups were no-contact control group, contact control group, no-contact media group, contact media group, and contact media-home visit group. This design separated the effect of the program from potential enhancement effects originating from personal contact and social support and from those of a measurement system : pre-and post measurement of energy strategies used by the participants, a measure of what they learned from the TV program, a measure of if the temperature and humidity changed when energy use deduced, and a measure of difference of comfort, sensation, and clothing within five groups. Only the reliability of electricity meter reading was reported.

RESULTS: The effects over time of the media intervention (TV program and booklet) were assessed for the five groups across the baseline, intervention, and summer follow-up phases on the main dependent measure of kilowatt-hour consumption. The results indicated that the use of home energy reduced about 9% - 10%. Without sacrificing life comfort, simple and no-cost strategies were adopted by viewers rather than complex strategies and those that involved some cost after the intervention of a brief but highly specific and targeted program. In addition, the viewers of the TV program diffused information to friends and co-workers and effects of the program might be increased.

REFERENCES: 23 Cited

208. Winkler, R. C. & Winett, R. A. (1982). Behavioral interventions in resource conservation: A systems approach based on behavioral economics. American Psychologist, 3(4), 421-435.

DESCRIPTORS: Behavior, energy education, synthesis of research, economic background, resource management education, conservation education

DEPENDENT VARIABLE: Percent reduction in overall targeted energy use.

INDEPENDENT VARIABLES: Budget share of gross monthly income expended for energy, cost per month of targeted energy source, gross annual household income.

PURPOSE: To describe the internal (psychological) and external (social-learning) systems relevant to behavioral approaches to teaching resource conservation and to indicate concepts and methods for integrating these systems into target-oriented behavioral interventions.

RESEARCH DESIGN: The four components to this report are: (1) a discussion of rebate studies in energy and water conservation; (2) a meta-analysis of 14 behavioral energy studies from 1973 to 1980 that shows effectiveness of rebates in changing energy consumption is a function of economics (budget share, income, or cost of energy expenditure); (3) an outline of field studies to modify perceptions of energy conservation; and (4) an illustration of a rebate system that fits in with planning policies to reduce water consumption.

RESULTS: Data and discussion demonstrate that planning form resource conservation without including a systemic and economic approach toward human behavior is insufficient. Interdisciplinary conceptualization is required in resource management. Authors develop a framework, "maximization theory," that combines psychological and economic analyses and techniques for resource management.

REFERENCES: 59 cited

209. Winett, R. A. & Kagel, J. H. (1984). Effects of information presentation format on resource use in field studies. Journal of Consumer Research, 11(2), 655-667.

DESCRIPTORS: Behavior, conservation education, resource management education, energy education, synthesis of research

VARIABLES: Field studies are reviewed regarding antecedent strategies (brochures and booklets, prompts, and modeling) and consequence strategies (feedback and rebates).

PURPOSE: To review recent experimental field studies in resource conservation and to draw conclusions about the effectiveness of particular formats for presenting information.

RESEARCH DESIGN: Authors review experimental field studies in psychological behavior regarding resource conservation, discussing different experimental methodologies used to determine the impact of information flows on behavior. The research of one author (Winett) is highlighted. An outline of the two basic types of strategies used to promote resource conservation (antecedent strategies used to promote resource conservation - antecedent (brochures and booklets, prompts, modeling) and consequence (feedback and rebates) is presented. Reasons why applications of particular procedures succeed or fail are identified. Confounding effects and variables in field studies are accounted for. Future policy applications are discussed.

RESULTS: Effectiveness in reducing resource consumption is apparently the result of the presentation of information about conservation strategies in a clear and precise manner. Of the various media available to planners (audio, print, and video), video is discussed as having most noticeable benefits in reaching specific segments of population. Recommendations for planning information presentation are presented. Information presentation format research is called for. The role of incentives and motivation in planning consumer information is recognized.

REFERENCES: 54 cited

210. Zoller, U., Ebenezer, J., Morely, K., Paras, S., Sandberg, V., West, C., Wolthers, T., Tan, S. H., (1990) Goal attainment in science-technology-society (S/T/S) education and reality: The case of British Columbia. Science Education, 74(1), 19-36.

DESCRIPTORS: Issue awareness/knowledge of issues, issue identification and analysis skills, secondary, cognitive, affective, program evaluation, ex post facto research, STS education

INDEPENDENT VARIABLES: Participation in ST 11 course and gender.

DEPENDENT VARIABLES: Student beliefs/positions regarding S/T/S.

PURPOSE: To answer the question, "Do S/T/S courses actually work?" Specific objectives included: assessment of senior high school students viewpoints concerning S/T/S, assessment of attainment of ST 11 (British Columbia S/T/S course) superordinate goals, obtain preliminary data-base for future policy making, and evaluate particular local constraints of implementing S/T/S courses in British Columbia.

SUBJECTS: Randomly selected 12th graders (N=473) from the Greater Vancouver area - 101 who had completed ST 11 course (experimental group), 276 who had not taken ST 11 (control group) and 96 students currently enrolled in ST 11.

RESEARCH DESIGN: Pilot study using a short version of the VOSTS inventory for assessing high school students' S/T/S- related beliefs/postions. Reliability and validity of VOSTS were referenced to Aikenhead (1987). A S/T/S response profile was constructed from the VOSTS responses for comparison of ST 11 and non ST 11 students. A chi square test with an alpha level of 0.025 was used to test for differences between groups and gender.

RESULTS: ST 11 students favored the public deciding on S/T/S issues, believed that scientists should be held responsible for harm that might come from their discoveries, and envisioned science in a social context. ST 11 students attained 2 of the 3 superordinate S/T/S goals. Gender differences were observed in one instance (the "blind idealism" myth that scientists are neutral and objective). The authors concluded the the VOSTS inventory is an efficient and useful instrument for S/T/S evaluation.

REFERENCES: 36 cited

211. Zoller, U., Tan, S., Ebenezer, J., Morely, K., Paras, S., Sandberg, V., West, C., & Wothers, T. (1990). Goal Attainment in Science-Technology-Society (S/T/S) Education and Reality: The Case of British Columbia. Science Education, 74(1), 19-36.

DESCRIPTORS: S/T/S education, program evaluation, secondary, ex post facto research, multi-disciplinary, beliefs

INDEPENDENT VARIABLE: Participation in Science-Technology-Society (S/T/S) courses/curricula.

DEPENDENT VARIABLE: Student attitudes related to S/T/S.

PURPOSE: To evaluate already-implemented Science-Technology-Society (S/T/S) courses/curricula on a large scale for goal attainment.

SUBJECTS: 12th graders (N=473) at six randomly-selected public/comprehensive schools with a total student body of 7585 in the Greater Vancouver area during the first term of the school year 1987/88. A total of 101 students who completed the ST 11 course (41 males and 60 females), 276 "non ST 11" students (130 males and 146 females) and 96 students who were currently (in the school year 1987/88) enrolled in the ST 11 course participated in the study (N=473).

RESEARCH DESIGN: A descriptive survey research design was employed. A questionnaire comprised of four representative statements selected from the Views on Science-Technology-Society (VOSTS) form constituted the research instrument for assessing the high school students' S/T/S-related beliefs/positions. Multiple S/T/S attitude positions were given asking students what position they agree with the most. An S/T/S "response profile" of ST 11 students was compared to a non ST 11 "response profile."

RESULTS: The "response profile" of male and females were similarly constructed. The significance of the difference (a=0.025) between the ST 11 students and not ST 11 students was tested using Chi-square analysis for each of the four items within the total, male, and female "response profiles." A significant difference between the two student populations was apparent for three of the four questions/statements. The "response profile" of students currently enrolled in the ST 11 course provided evidence that the assumption about the equivalence of the ST 11 and non ST 11 groups at the start is justified. Clearly the ST 11 course does have an impact on the S/T/S viewpoints on senior high school students. A gender difference was detected only for the question addressing disagreement between scientists. Some of the prespecified goals of ST 11 which are typical of S/T/E/S courses world-wide have been obtained, but some of the related sub-goals have not been achieved.

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Introduction to Citations from the Dissertation Literature

Purpose and Time Parameters

The dissertation literature is a sizeable and important body of research literature in most areas of educational endeavor. This is especially true for the field of Environmental Education (EE). Portions of the dissertation literature covering the 1971-1980 period have been included in a number of collections and reviews of EE research (e.g., Roth & Helgeson, 1972; Roth, 1976; Iozzi, 1981, 1984), though no one of these is comprehensive. Further, there is no existing list of dissertations in EE covering the period since that time (1981-1990). Consequently, there is no comprehensive list of dissertations in the field of EE covering the 1971-1990 time period. Given these observations, the overall purpose of this effort was to identify and included in this Section:

(A) those dissertations in and related to the field of EE covering the period January, 1971 through December, 1980 which were not included in the previous collection of dissertation abstracts prepared by the Research Commission (Iozzi, 1981); and

(B) those dissertations in and related to the field of EE covering the period January, 1981 through December, 1990.

For the purpose of clarity, the sets of dissertations from these two time periods have been kept separate, and comprise the two sub-sections found in this section.

Search Parameters

The search was conducted using the following source materials:

* Comprehensive Dissertation Index (CDI);
* Research in Environmental Education, 1971-1980 (RIEE; Iozzi, 1981);
* Recent Graduate Works in Environmental Education and Communications published by NAAEE (RGW; 1978-1989);
* An Interpretive Research Bibliography (IRB-1; Winzeler & Cherem, 1978),
* An Interpretive Research Bibliography, 1978-1984 (IRB-2; Moore & Gross, 1985),
* Dissertations in ECO-Education (DIEE; Swan & Stilson, 1980).

Both Dissertation Abstracts International (DAI), and American Doctoral Dissertations (ADD) were used as supporting documents.

(A) Within the "Education", "Mass Communications", "Psychology" and "Sociology" sections of CDI, manual title searches were run using the descriptors listed on the following pages (see II). These descriptors were used since they reflect the set of descriptors used to code studies in RIEE and in this document.

The descriptors used were:

- conservation;
- ecology and ecological;
- energy;
- environment, environmental/education, and environments;
- marine;
- nature and natural;
- pollution;
- population; and
- resource/resources.

Studies located under these descriptors were included if they:

(1) had not been included within RIEE;
(2) reflected the definition of "Environmental Education Research" posed at the outset of this document; and
(3) addressed formal EE, non-formal EE (i.e., including interpretation, adult and continuing education), informal EE (i.e., all forms of communications), and/or pertinent social research (i.e., social research on phenomena, questions or variables deemed relevant to EE).

All titles which fit these three criteria were entered into an alphabetical list within its respective sub-section (i.e., 1971-80 or 1981-90). Those studies which could not be verified as fitting criteria (2) and/or (3) from their title alone were temporarily included, and so noted for further consideration.

(B) These two alphabetical lists were then checked against the lists of dissertations included in RGW, IRB-1, IRB-2, and DIEE. Any dissertations from these sources which fit the three criteria used to select dissertations from CDI were also included within the respective alphabetical list.

(C) In the next step, complete abstracts (DAI) for those dissertations whose titles were ambiguous were reviewed. At this point, one of three decisions was made:

(1) include the dissertation in the final list;
(2) delete it, for it did not fit the EE research parameters noted above; or
(3) xerox the full abstract for further review (e.g., by other members of the Research Commission).

This process could not be applied to those dissertations which appeared only in ADD, for those dissertations lacked complete abstracts.

Reviewing, Coding, and Indexing

Once final alphabetical lists for both time periods were readied, four activities were undertaken.

(A) First, each dissertation was assigned a number following its alphabetical sequence. Once all dissertations from the 1971-1980 time period were assigned numbers (i.e., 212-522), the same was done for all dissertations from the 1981-1990 time period (i.e., 523-829).

(B) Second, up to ten descriptors were selected for each study using dissertation titles and/or abstracts. For dissertations included in DAI, efforts were made to select as many relevant descriptors as possible on the basis of information contained in the abstracts. If a dissertation was listed in ADD and not in DAI, information used in coding a study was limited to its title. Since coding ADD studies on the basis of title alone increases the probability of errors of commission and omission, only those descriptors which were clearly reflected in the titles were included.

Due to the volume and diversity of studies within the two lists of dissertations, additional descriptors were added to the list of descriptors used to code the periodical literature. This was done to allow users of this document to more easily identify relevant sets of dissertations contained within the two lists. This expanded list of descriptors immediately follows this introduction.

(C) Third, as with the journal literature, the number assigned each dissertation was included in the appropriate desriptor lists within the alphabetized "Descriptor Index" located at the end of this document (i.e., including all initial and all added descriptors). The purpose of this index is to help interested users more quickly and easily locate potentially relevant dissertation research.

(D) Finally, author's names and document numbers were included in the "Author Index" which follows the "Descriptor Index". This was done to help interested users more easily access research by particular individuals.

EXPANDED LIST OF DESCRIPTORS USED TO CODE DISSERTATIONS

CATEGORIES	**INITIAL DESCRIPTORS**	**ADDED DESCRIPTORS**
EE GOAL LEVELS	Environmental Sensitivity	
	Ecology Education	
	Issue Awareness/Knowledge of Issues	
	Issue Identification & Analysis Skills	
	Issue Investigation & Evaluation Skills	
	Values Clarification Skills	
	Citizenship Action	
EE FACILITIES	Outdoor Classrooms	Camps/Residential Centers
	Environmental/Nature Centers	Parks/Natural Areas
	Museums	Wilderness
	Community Resources	

CATEGORIES	**INITIAL DESCRIPTORS**	**ADDED DESCRIPTORS**
EDUCATION LEVEL	Elementary Middle/Junior High Secondary Higher Education Adult/Continuing Education Teacher Education Preservice Teacher Education Inservice	Early Childhood K-12 State Agencies/Programs National Agencies/Programs
LEARNING DOMAIN	Cognitive Affective Psychomotor	
NATURE OF STUDY	Program Development Program Implementation Program Evaluation Hypothesis Generation Model Building Instrument Development	Social Research Curriculum Development Status Study Needs Assessment Master Planning
RESEARCH METHODS	Historical Research Theoretical Research Experimental Research Pre-experimental Research Ex Post Facto Research Descriptive Research Naturalistic Research Unobtrusive Research Secondary Analysis Trend Analysis Synthesis of Research	Document Analysis Prediction Research Delphi Study
EE CURRICULUM MODE	Interdisciplinary Multi-Disciplinary (infusion) Disciplinary Formal Non-Formal	
EE METHODS	Individualized Instruction Inquiry/Investigation Action Learning Lecture Directed Instruction Field Trip Outdoor Education Games Simulations Role Plays Values/Moral Education Case Study	Laboratory-Based Media-Based Computerized Instruction Text-Based Social Learning Methods Behavioral Methods Discussion

CATEGORIES	**INITIAL DESCRIPTORS**	**ADDED DESCRIPTORS**
EE LEARNER TRAITS	Eductional Background	Community Attributes
	Social "	Political Views
	Ethnic "	Group Membership
	Economic "	Residence
	Rural	Gender
	Urban	Age
	Personality Type	Sources of Information
	Environmental Sensitivity	Aptitude
	Intelligence	Concepts
	Cognitive Style	Cognitive Strategies
	Knowledge	Visual Perceptions/ Preferences
	Perceptions/Beliefs	
	Preferences	Concern
	Attitudes	Optimism/Pessimism
	Values	
	Moral Development	
	Locus of Control/Efficacy	
	Personal Responsibility	
	Verbal Commitment	
	Behaviors	
	Citizenship	
EE CONTENT AREA	Outdoor Education	Nature Study
	Conservation Education	Health Education
	Resource Management Education	Interpretation
	Vocational Education	Communications
	Mathematics Education	Geographic Education
	Language Arts Education	
	Social Studies Education	
	Science Education	
	STS Education	
	Issue-Based	
	Population Education	
	Energy Education	
	Marine Education	
	Global Education	
	Futures Education	
	Values/Moral Education	
	Religious Education	
OTHER		International Attitudes

DISSERTATION CITATION DESCRIPTORS, INITIAL AND ADDED
(n=131)

Action Learning
Adult/Continuing Education
Affective
Age
Aptitude
Attitudes

Behavioral Methods
Behaviors

Camps/Residential Centers
Case Study
Citizenship
Citizenship Action
Cognitive
Cognitive Strategies
Cognitive Style
Communications
Community Attributes
Community Resources
Computerized Instruction
Concepts
Concern
Conservation Education
Curriculum Development

Delphi Study
Descriptive Research
Directed Instruction
Disciplinary
Discussion
Document Analysis

Early Childhood
Ecology Education
Economic Background
Educational Background
Elementary
Energy Education
Environmental/Nature Centers
Environmental Sensitivity
Ethnic Background
Experimental Research
Ex Post Facto Research

Field Trip
Formal
Futures Education

Games
Gender
Geographic Education
Global Education
Group Membership

Health Education
Higher Education
Historical Research
Hypothesis Generation

Individualized Instruction
Inquiry/Investigation
Instrument Development
Intelligence
Interdisciplinary
International
Interpretation
Issue Awareness/Knowledge of Issues
Issue-Based
Issue Identification & Analysis Skills
Issue Investigation & Evaluation Skills

K-12
Knowledge

Laboratory-Based
Language Arts Education
Lecture
Locus of Control/Efficacy

Marine Education
Master Planning
Mathematics Education
Media-Based
Middle/Junior High
Model Building
Moral Development
Multi-Disciplinary
Museums

National Agencies/Programs
Naturalistic Research
Nature Study
Needs Assessment
Non-Formal

Optimism/Pessimism

DISSERTATION CITATION DESCRIPTORS, INITIAL AND ADDED (n=131)

Outdoor Classrooms
Outdoor Education

Parks/Natural Areas
Perceptions/Beliefs
Personal Responsibility
Personality Type
Political Views
Population Education
Prediction Research
Pre-experimental Research
Preferences
Program Development
Program Evaluation
Program Implementation
Psychomotor

Religious Education
Residence
Resource Management Education
Role Plays
Rural

Science Education
Secondary
Secondary Analysis
Simulations
Social Background
Social Learning Methods
Social Research
Social Studies Education
Sources of Information
State Agencies/Programs
Status Study
STS Education
Synthesis of Research

Teacher Education Inservice
Teacher Education Preservice
Text-Based
Theoretical Research
Trend Analysis

Unobtrusive Research
Urban

Values
Values Clarification Skills
Values/Moral Education

Verbal Commitment/Intention
Visual Perceptions/Preferences
Vocational Education

Wilderness

DISSERTATION CITATIONS, 1971-1980

212. Agar, D.J. (1980). A survey of strategies used by schools of education and museum education departments in preparing teachers to utilize museum facilities and resources. (Doctoral dissertation, University of Pittsburgh, 1980). Dissertation Abstracts International, 41(3), 904-A. UMI No. DEM80-18282.

Descriptors: Museums, Higher Education, Teacher Education Preservice, Teacher Education Inservice, Status Study, Descriptive Research, Naturalistic Research

213. Allen, I.A. (1980). The development of an environmental science course for primary schools, grades 1-7 Zimbabwe Rhodesia. (Doctoral dissertation, University of Arizona, 1980). Dissertation Abstracts International, 41(1), 186-A. UMI No. DEM80-15596.

Descriptors: Environmental Sensitivity, Ecology Education, Citizenship Action, Elementary, Curriculum Development, Descriptive Research, Naturalistic Research, Formal

214. Allman, S.A. (1972). Identification of environmental education concepts for inclusion in an elementary school curriculum. (Doctoral dissertation, University of Nebraska, 1972). Dissertation Abstracts International, 33(5), 2173-A. UMI No. 72-27378.

Descriptors: Issue Awareness/Knowledge of Issues, Elementary, Teacher Education Preservice, Curriculum Development, Theoretical Research, Descriptive Research, Multi-Disciplinary, Concepts, Attitudes, Values/Moral Education

215. Altaffer, F.B. (1980). Support for energy policies: The role of social background, information, and value orientation. (Doctoral dissertation, Boston College, 1980). Dissertation Abstracts International, 41(6), 2380-B. UMI No. DEM80-26745.

Descriptors: Issue Identification and Analysis Skills, Hypothesis Generation, Social Research, Social Background, Eductional Background, Preferences, Values, Energy Education

216. Amer, I.A. (1980). A comparison of two environmental education programs: A pollution unit as used in secondary schools and a BSCS-type pollution unit as measured by achievement and attitude. (Doctoral dissertation, The Pennsylvania State University, 1980). Dissertation Abstracts International, 41(3), 1010-A. UMI No. DEM80-15781.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Experimental

Research, Text-Based, Knowledge, Attitudes, Science Education, International

217. Anderson, E. (1979). Visual resource assessment: Local perceptions of familiar natural environments. (Doctoral dissertation, University of Michigan, 1978). Dissertation Abstracts International, 39(10), 4666-B. UMI No. 79-07019.

Descriptors: Instrument Development, Social Research, Educational Background, Visual Perceptions/Preferences, Resource Management Education

218. Anstey, J. (1975). A comparison of chief executives leadership styles and personal values with his orientation concerning the firm's social responsibility in air and water pollution. (Doctoral dissertation, University of Arkansas, 1974). Dissertation Abstracts International, 35(10), 6298-A. UMI No. 74-28138.

Descriptors: Citizenship Action, Social Research, Descriptive Research, Personality Type, Attitudes, Values, Behaviors

219. Aronstein, L.W. (1972). A study of attitudinal changes in college students as a result of constructive participation in an environmental community service project. (Doctoral dissertation, State University of New York at Buffalo, 1972). Dissertation Abstracts International, 33(3), 1069-A. UMI No. 72-23846.

Descriptors: Citizenship Action, Higher Education, Affective, Program Evaluation, Pre-Experimental Research, Action Learning, Attitudes, Locus of Control/Efficacy

220. Arrington, J.D. (1973). Analysis of ecological content in elementary social studies textbooks adopted by the State of Indiana for grades three through six. (Doctoral dissertation, Indiana University, 1972). Dissertation Abstracts International, 33(9), 4654-A. UMI No. 73-6949.

Descriptors: Ecology Education, Elementary, Document Analysis, Descriptive Research, Social Studies Education

221. Asche, W.E. (1973). The development and testing of an environmental attitude scale. (Doctoral dissertation, Purdue University, 1972). Dissertation Abstracts International, 34(1), 217-A. UMI No. 73-15765.

Descriptors: Secondary, Instrument Development, Experimental Research, Formal, Attitudes, Issue-Based Vocational Education

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222. Askham, L.R. (1975). Classification of plants by children in an outdoor environment. (Doctoral dissertation, University of California, Berkeley, 1973). American Doctoral Dissertations, 1972/73, p. 182.

Descriptors: Outdoor Classrooms, Elementary, Cognitive, Outdoor Education, Science Education

223. Baclawski, M.M. (1978). Criteria for developing a model outdoor education resource center. (Doctoral dissertation, Michigan State University, 1977). Dissertation Abstracts International, 39(1), 213-A. UMI No. 78-10021.

Descriptors: Environmental/Nature Centers, Teacher Education Inservice, Program Development, Descriptive Research, Non-Formal, Outdoor Education

224. Bailey, A.W. (1980). Socioeconomic variables and attitudes of consumers related to energy conservation behavior. (Doctoral dissertation, Ohio State University, 1979). Dissertation Abstracts International, 40(10), 5341-A. UMI No. DEM80-08762.

Descriptors: Citizenship Action, Model Building, Social Research, Prediction Research, Economic Background, Attitudes, Behaviors, Energy Education

225. Bake, W.A. (1974). The visual tradition in American environmentalism. (Doctoral dissertation, University of Georgia, 1973). Dissertation Abstracts International, 34(9), 5674-A. UMI No. 74-4747.

Descriptors: Social Research, Historical Research, Visual Perceptions/Preferences, Conservation Education, Geographic Education

226. Baker, T.S. (1979). Environmental education: A multi-national study of curriculum innovation in higher education. (Doctoral dissertation, The Pennsylvania State University, 1978). Dissertation Abstracts International, 39(10), 5968-A. UMI No. DEL79-09042.

Descriptors: Higher Education, Program Development, Status Study, Historical Research, Naturalistic Research, Interdisciplinary, International

227. Baldridge, K.W. (1971). Nine years of achievement: The Civilian Conservation Corps in Utah. (Doctoral dissertation, Brigham Young University, 1971). Dissertation Abstracts International, 32(3), 1429-A. UMI No. 71-24265.

Descriptors: Parks/Natural Areas, National Agencies/Programs, Social Research, Historical Research, Program Evaluation, Conservation

Education

228. Barnes, P.J. (1976). The educator's guide to environmental education. (Doctoral dissertation, University of Miami, 1975). *Dissertation Abstracts International*, *36*(9), 5759-A. UMI No. 76-4690.

Descriptors: K-12, Cognitive, Affective, Program Development, Interdisciplinary, Nature Study, Urban

229. Bartell, T. (1974). Political alienation and perception of challenge outcomes: A study of the environmental movement. (Doctoral dissertation, The University of Michigan). *Dissertation Abstracts International*, *35*(5), 3125-A. UMI No. 74-25141.

Descriptors: Model Building, Social Research, Descriptive Research, Prediction Research, Educational Background, Group Membership, Perceptions/Beliefs, Locus of Control/Efficacy

230. Becker, L.J. (1977). Reinterpreting the motivational effects of feedback and goal setting on performance in a field study of residential energy conservation. (Doctoral dissertation, University of California at Davis, 1977). *Dissertation Abstracts International*, *38*(6), 2935-B. UMI No. DBJ77-27364.

Descriptors: Program Evaluation, Social Research, Experimental Research, Behavioral Methods, Attitudes, Behaviors, Energy Education

231. Bedwany, T.L. (1975). The status of women and population control: The relationship of gross reproduction rate and selected indicators of the status of women in developed and developing countries. (Doctoral dissertation, Michigan State University, 1974). *Dissertation Abstracts International*, *35*(11), 7417-A. UMI No. 75-7113.

Descriptors: Social Research, Descriptive Research, Educational Background, Economic Background, Attitudes, Values, Population Education, International

232. Bender, M. (1974). Alternative energy systems for the automobile: Implications for content derivation for teaching transportation technology. (Doctoral dissertation, West Virginia University, 1973). *Dissertation Abstracts International*, *34*(7), 3940-A. UMI No. 74-195.

Descriptors: Issue Awareness/Knowledge of Issues, Cognitive, Model Building, Curriculum Development, Theoretical Research, STS Education, Energy Education

233. Bennett, D. (1973). The development of a model to evaluate the attitudinal and behavioral goals of K-12 environmental education. (Doctoral dissertation, The University of Michigan, 1972). Dissertation Abstracts International, 33(9), 4785-A. UMI No. 73-6791.

Descriptors: K-12, Cognitive, Affective, Program Evaluation, Instrument Development, Experimental Research, Formal

234. Berger, T.E. (1973). Evaluation of an environmental science laboratory curriculum. (Doctoral dissertation, Columbia University, 1972). Dissertation Abstracts International, 33(8), 4196-A. UMI No. 73-12579.

Descriptors: Issue Awareness/Knowledge of Issues, Higher Education, Program Evaluation, Experimental Research, Laboratory-Based, Knowledge, Attitudes, Science Education

235. Bernardo, J.R. (1975). Museum environments for communications: A study of environmental parameters in the design of museum experiences. (Doctoral dissertation, Columbia University, 1972). Dissertation Abstracts International, 35(12), 7932-A. UMI No. 75-12302.

Descriptors: Museums, Model Building, Program Development, Instrument Development, Theoretical Research, Non-Formal

236. Blalock, C.D. (1980). Community educational processes: Group perceptions of energy issues. (Doctoral dissertation, University of Florida, 1980). Dissertation Abstracts International, 41(6), 2420-A. UMI No. DEM80-29045.

Descriptors: Issue Awareness/Knowledge of Issues, Higher Education, Instrument Development, Descriptive Research, Educational Background, Attitudes, Energy Education

237. Blinn, R.J. (1973). Analysis of urban aesthetics components of existing environmental education curricula. (Doctoral dissertation, University of Southern California, 1973). Dissertation Abstracts International, 34(2), 553-A. UMI No. 73-18797.

Descriptors: Environmental Sensitivity, K-12, Status Study, Program Evaluation, Formal, Perceptions/Beliefs, Urban

238. Blomme, M.A. (1976). Attitude change and achievement in an environmentally-oriented general chemistry course for non-majors. (Doctoral dissertation, University of Michigan, 1975). Dissertation Abstracts International, 36(10), 6579-A. UMI No. DAH76-9321.

Descriptors: Issue Awareness/Knowledge of Issues, Higher Education, Program Evaluation, Experimental Research, Multi-Disciplinary, Knowledge, Attitudes, Science Education

239. Bluhm, L. (1974). Some pollution-related attitudes of high school youth in the United States and Brazil. (Doctoral dissertation, University of Illinois at Champaign-Urbana, 1973). Dissertation Abstracts International, 34(12, Part 1), 7882-A. UMI No. 74-11950.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Pre-Experimental, Lecture, Personality Type, Attitudes, International

240. Bogunjoko, I.O. (1977). Analysis of an innovative adult education program: The case of agriculture and environment. (Doctoral dissertation, Iowa State University, 1977). Dissertation Abstracts International, 38(6), 3209-A. UMI No. DBJ77-25972.

Descriptors: Citizenship Action, Adult/Continuing Education, Program Evaluation, Experimental Research, Perceptions/Beliefs, Attitudes, Behaviors, Resource Management Education

241. Bohl, W.B. (1977). A survey of cognitive and affective components of selected environmentally related attitudes of tenth, and twelfth-grade students in six mideastern, four southwestern, and twelve plains and mountain states. (Doctoral dissertation, Ohio State University, 1976). Dissertation Abstracts International, 37(8), 4717-A. UMI No. DBJ77-2352.

Descriptors: Secondary, Status Study, Descriptive Research, Gender, Residence, Knowledge, Perceptions/Beliefs, Attitudes

242. Boone, J.R. (1972). Simulations, concern level, grade level and sex as factors influencing the assignment of importance to environmental concepts. (Doctoral dissertation, Texas A&M University, 1972). Dissertation Abstracts International, 33(3), 951-A. UMI No. 72-24288.

Descriptors: Middle/Junior High, Experimental Research, Simulations, Gender, Concepts, Perceptions/Beliefs, Concern, Resource Management Education

243. Bost, R.L. (1979). The use of recreational activties to teach environmental concepts to family campers. (Doctoral dissertation, Oklahoma State University, 1979). Dissertation Abstracts International, 40(6), 2997-A. UMI No. DEL79-28192.

Descriptors: Outdoor Classrooms, Adult/Continuing Education, Experimental Research, Non-Formal, Outdoor Education, Concepts, Attitudes

244. Brady, E.R. (1973). The effectiveness of field trips compared to media in teaching selected environmental concepts. (Doctoral dissertation, Iowa State University, 1972). Dissertation Abstracts International, 33 (8), 4196-A. UMI No. 73-3860.

Descriptors: Issue Awareness/Knowledge of Issues, Experimental Research, Field Trip, Media-Based, Gender, Concepts, Attitudes, Science Education

245. Brennan, A.J. (1975). Development of an objective knowledge test instrument in the field of environmental health. (Doctoral dissertation, University of Wisconsin - Madison, 1975). Dissertation Abstracts International, 36(5), 2656-A. UMI No. 75-18164.

Descriptors: Issue Awareness/Knowledge of Issues, Teacher Education Pre-Service, Teacher Education Inservice, Instrument Development, Descriptive Research, Health Education

246. Brice, R.A. (1974). A procedural model for developing environmental education programs for teachers of young children. (Doctoral dissertation, University of Georgia, 1973). Dissertation Abstracts International, 34(7), 4052-A. UMI No. 73-31859.

Descriptors: Ecology Education, Early Childhood, Teacher Education Pre-Service, Teacher Education Inservice, Model Building, Program Development, Program Evaluation, Instrument Development

247. Bridgeland, W. (1974). Community structure, environmental issue specificity and the level of citizen mobilization for environmental quality. (Doctoral dissertation, University of Illinois at Champaign-Urbana, 1973). Dissertation Abstracts International, 34(12, Part 1), 7882-A. UMI No. 74-11954.

Descriptors: Citizenship Action, Model Building, Prediction Research, Community Attributes

248. Brigham, A.J. (1974). The frequency and significance of environmental concepts as found in literature for primary grade children. (Doctoral dissertation, University of Wyoming, 1972). American Doctoral Dissertations, 1971/72, p. 147.

Descriptors: Elementary, Cognitive, Document Analysis, Descriptive Research, Concepts, Language Arts Education

249. Brown, N.A. (1971). Characteristics and influence patterns of students who enroll in the College of Agriculture and Natural Resources after first enrolling in another college. (Doctoral dissertation, Michigan State University, 1970). Dissertation Abstracts International, 31(7), 3433-A. UMI No. 71-02039.

Descriptors: Environmental Sensitivity, Higher Education, Descriptive Research, Educational Background, Sources of Information, Resource Management Education

250. Bruce, R.G. (1973). The impact of a direct marine science experience upon secondary school students. (Doctoral dissertation, University of Southern California, 1973). Dissertation Abstracts International, 34(6), 3012-A. UMI No. 73-30007.

Descriptors: Outdoor Classrooms, Middle/Junior High, Secondary, Cognitive, Affective, Program Evaluation, Pre-Experimental, Laboratory-Based, Marine Education

251. Bruker, R.M. (1973). A survey of environmental education programs in selected high schools of Illinois and Missouri. (Doctoral dissertation, Southern Illinois University at Carbondale, 1972). Dissertation Abstracts International, 33(9), 4324-B. UMI No. 73-6189.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Teacher Education Inservice, Status Study, Program Evaluation, Descriptive Research, Urban, Rural, Science Education, Social Studies Education

252. Brunckhorst, W.L. (1972). The development of a theoretical model based on the six realms of meaning for the purpose of developing an interdisciplinary environmental studies program. (Doctoral dissertation, University of Mississippi, 1971). Dissertation Abstracts International, 32(7), 3856-A. UMI No. 72-03916.

Descriptors: Secondary, Higher Education, Cognitive, Affective, Model Building, Program Development, Theoretical Research, Interdisciplinary

253. Bryan, W.L. (1974). An identification and analysis of power-coercive change strategies and techniques utilized by selected environmental change agents. (Doctoral dissertation, University of Michigan, 1971). Dissertation Abstracts International, 34(8), 3832-B. UMI No. 74-3756.

Descriptors: Citizenship Action, Theoretical Research, Descriptive Research, Behaviors

254. Bundy, J.N. (1975). An analysis of literature to develop the environmental health content for school curriculum. (Doctoral dissertation, West Virginia University, 1974). Dissertation Abstracts International, 35(8), 4973-A. UMI No. 75-4969.

Descriptors: Issue Awareness/Knowledge of Issues, Teacher Education

Preservice, Curriculum Development, Theoretical Research, Formal, Concepts, Health Education

255. Burchett, B.M. (1972). A descriptive study of fourth, fifth, and sixth grade students' attitudes relating to environmental problems. (Doctoral dissertation, Indiana University, 1971). Dissertation Abstracts International, 32(8), 4439-A. UMI No. 72-06670.

Descriptors: Elementary, Teacher Education Preservice, Pre-Experimental Research, Attitudes, Issue-Based

256. Carter, D.M. (1972). Visual environmental education: The use of vision as the primary sensory mode of perception in the teaching of the fundamentals of environmental education. (Doctoral dissertation, University of Massachusetts, 1972). Dissertation Abstracts International, 33(2), 494-A. UMI No. 72-22023.

Descriptors: Environmental Sensitivity, Issue Awareness/Knowledge of Issues, Higher Education, Curriculum Development, Theoretical Research, Urban, Visual Perceptions/Preferences

257. Carvey, D.G. (1976). A study of development preferences and socio-economic structure in the Resource Conservation and Development Program: A comparative analysis. (Doctoral dissertation, Michigan State University, 1975). Dissertation Abstracts International, 36(12), 8197-A. UMI No. DAH76-12407.

Descriptors: Issue Indentification and Analysis Skills, Issue Investigation and Evaluation Skills, Values Clarification Skills, Citizenship Action, Social Research, Program Evaluation, Historical Research, Community Attributes, Rural

258. Cauley, M.J. (1972). Industrial arts and environmental education: Environmental concepts applicable to industrial arts teaching areas by industrial arts teacher educators. (Doctoral dissertation, University of Northern Colorado, 1971). Dissertation Abstracts International, 32(10), 5583-A. UMI No. 72-13307.

Descriptors: Secondary, Curriculum Development, Theoretical Research, Multi-Disciplinary, Concepts, Resource Management Education, Vocational Education

259. Cherem, G. (1974). Visitor responsiveness to a nature trail environment. (Doctoral dissertation, University of Michigan, 1973). Dissertation Abstracts International, 34(8), 3579-B. UMI No. 74-3599.

Descriptors: Parks/Natural Areas, Program Development, Naturalistic

Research, Document Analysis, Non-Formal, Visual Perceptions/ Preferences, Interpretation

260. Clark, L.E. (1977). Population education in American high schools: Towards a theory and application. (Doctoral dissertation, University of Massachusetts, 1977). Dissertation Abstracts International, 38(6), 3407-A. UMI No. DBJ77-21989.

Descriptors: Secondary, Curriculum Development, Theoretical Research, Inquiry/Investigation, Population Education

261. Clark, P.G. (1980). Selected moral dilemmas in population program design and implementation: Kenya and the Philippines. (Doctoral dissertation, Harvard University, 1979). American Doctoral Dissertations, 1978/79, p. 442.

Descriptors: Issue Awareness/Knowledge of Issues, Curriculum Development, Values/Moral Education, Moral Development, Population Education

262. Cole, B. (1972). A social learning approach to environmental concern. (Doctoral dissertation, The University of Connecticut). Dissertation Abstracts International, 32(11), 6638-B. UMI No. 72-14222.

Descriptors: Issue Awareness/Knowledge of Issues, Citizenship Action, Higher Education, Experimental Research, Social Learning Methods, Political Views, Locus of Control/Efficacy, Concern, Behaviors

263. Cole, S.L. (1976). Implementation aspects of an ecosystem approach: Conservation of natural resources program, University of California, Berkeley: 1969-1972.(Doctoral dissertation, University of California, Berkeley, 1975). Dissertation Abstracts International, 37(1), 53-B. UMI No. DAH76-15146.

Descriptors: Issue Identification and Analysis Skills, Issue Investigation and Evaluation Skills, Citizenship Action, Higher Education, Model Building, Program Development, Theoretical Research

264. Collins, L.D. (1977). Social comparison and objective standard feedback as means of reducing residential energy consumption. (Doctoral dissertation, George Washington, University, 1976). Disseration Abstracts International, 37(11), 5878-B. UMI No. DBJ77-10124.

Descriptors: Social Research, Experimental Research, Behavioral Methods, Behaviors, Energy Education

265. Conception-Medel, P. (1974). A conceptual framework for environmental education adapted to the Philippine environment. (Doctoral dissertation, Michigan State University, 1974). Dissertation Abstracts International, 35(6), 3387-A. UMI No. 74-27452.

Descriptors: Community Resources, Teacher Education Inservice, Curriculum Development, Theoretical Research, Multi-Disciplinary, Inquiry/Investigation, Science Education, International

266. Cook, F.R. (1980). Third world population: The effect of high school enrollment on fertility. (Doctoral dissertation, University of California at Irvine, 1980). Dissertation Abstracts International, 41(3), 1227-A. UMI No. DEM80-19688.

Descriptors: Secondary, Social Research, Trend Analysis, Social Background, Educational Background, Behaviors, Population Education, International

267. Cooper, M.A. (1971). A community action program in conservation education for preservice elementary school teachers. (Doctoral dissertation, Michigan State University, 1971). Dissertation Abstracts International, 32(6), 3421-B. UMI No. 71-31179.

Descriptors: Issue Awareness/Knowledge of Issues, Citizenship Action, Community Resources, Elementary, Teacher Education Preservice, Curriculum Development, Program Evaluation, Pre-Experimental Research, Action Learning, Conservation Education

268. Crafts, R.C. (1974). A study of current ecological conditions as perceived by faculty of the natural sciences, social sciences, and humanities. (Doctoral dissertation, Indiana University, 1973). Dissertation Abstracts International, 34(8), 4777-A. UMI No. 74-2638.

Descriptors: Issue Awareness/Knowledge of Issues, Higher Education, Descriptive Research, Group Membership, Concepts, Perceptions/Beliefs

269. Cummings, L.D. (1976). Mobilization of recyclers into the environmental movement. (Doctoral dissertation, State University of New York at Stony Brook, 1975). Dissertation Abstracts International, 36(7), 4768-A. UMI No. DAH75-29148.

Descriptors: Citizenship Action, Social Research, Descriptive Research, Naturalistic Research, Behaviors

270. Cummings, S.L. (1975). Environmental education: A market survey. (Doctoral dissertation, Stanford University, 1975). Dissertation Abstracts International, 36(5), 2587-A. UMI No. 75-25511.

Descriptors: Teacher Education Inservice, Descriptive Research, Educational Background, Political Views, Attitudes, Preferences, Science Education, Social Studies Education, Language Arts Education

271. Curl, H. (1973). Environmentalism in a small city. (Doctoral dissertation, University of Oregon, 1972). Dissertation Abstracts International, 33(12, Part 1), 7033-A. UMI No. 73-13730.

Descriptors: Environmental Sensitivity, Social Research, Prediction Research, Urban, Sources of Information, Economic Background, Preferences, Concern, Behaviors

272. Dale, J.R. (1973). The effects on achievement of using the forced inferential response mode in an intermediate grade population-geography unit. (Doctoral dissertation, University of Georgia, 1972). Dissertation Abstracts International, 33(11), 6053-A. UMI No. 73-5676.

Descriptors: Issue Awareness/Knowledge of Issues, Middle/Junior High, Program Evaluation, Experimental Research, Media-Based, Behavioral Methods, Knowledge, Population Education, Geographic Education

273. Dalton, E.A. (1979). Energy and Man's Environment: Its impact on educators in seven western states. (Doctoral dissertation, Brigham Young University, 1979). Dissertation Abstracts International, 40(1), 80-A. UMI No. DEL79-16537.

Descriptors: Issue Awareness/Knowledge of Issues, Teacher Education Inservice, Program Evaluation, Ex Post Facto Research, Text-Based, Concepts, Energy Education

274. Davis, T.L. (1974). Environmental education programs of selected cooperative extension service personnel. (Doctoral dissertation, Texas A&M University, 1973). Dissertation Abstracts International, 34(12), 7507-A. UMI No. 74-13057.

Descriptors: Community Resources, Teacher Education Inservice, Adult/Continuing Education, National Agencies/Programs, Status Study, Needs Assessment, Descriptive Research, Educational Background, Attitudes

275. Delaini, J.M. (1977). An internship at the United States National Museum of Natural History. Part I - Internship. Part II - An evaluation of the effectiveness of docents at the National Museum of Natural History. (Doctoral dissertation, Claremont Graduate School, 1977). Dissertation Abstracts International, 37(10), 6386-A. UMI No. DBJ77-7705.

Descriptors: Museums, Cognitive, Program Evaluation, Pre-Experimental Research, Field Trip, Knowledge, Nature Study, Interpretation

276. Dickerson, L.T. (1974). The relationship of the Youth Conservation Corps experience to selected dimensions of adolescents' self-concept. (Doctoral dissertation, New York University, 1973). Dissertation Abstracts International, 34(12), 6096-B. UMI NO. 74-12875.

Descriptors: Camps/Residential Centers, National Agencies/Programs, Program Evaluation, Descriptive Research, Economic Background, Age, Gender, Perceptions/Beliefs, Conservation Education

277. Donoho, R.W. (1978). Development and evaluation of instructional units designed for teaching energy conservation and alternative sources of energy at the community college level. (Doctoral dissertation, Kansas State University, 1977). Dissertation Abstracts International, 38(9), 5302-A. UMI No. DDK78-00810.

Descriptors: Issue Awareness/Knowledge of Issues, Citizenship Action, Higher Education, Curriculum Development, Program Evaluation, Pre-Experimental Research, Knowledge, Energy Education

278. Dorsey, A.H. (1972). A survey study of the comparative status of understanding and reasoning in conservation concepts by ninth grade students in the public schools of South Carolina. (Doctoral dissertation, University of Virginia, 1972). Dissertation Abstracts International, 33(2), 549-A. UMI No. 72-22643.

Descriptors: Secondary, Status Study, Descriptive Research, Ethnic Background, Residence, Gender, Knowledge, Conservation Education

279. Duenwald, L.P. (1972). A survey of the role of State Education Agencies in the support of environmental education. (Doctoral dissertation, University of South Dakota, 1971). Dissertation Abstracts International, 32(9), 5236-B. UMI No. 72-08381.

Descriptors: Teacher Education Preservice, Teacher Education Inservice, State Agencies/Programs, Status Study, Master Planning, Curriculum Development, Program Development, Descriptive Research, Science Education

280. Dunlap, R. (1973). Legislative voting on environmental issues: An analysis of the impact of party membership. (Doctoral dissertation, University of Oregon). Dissertation Abstracts International, 34(3), 1370-A. UMI No. 73-20200.

Descriptors: Citizenship Action, Social Research, Descriptive Research, Educational Background, Economic Background, Political Views, Concern, Behaviors

281. DuPont, S.I. (1976). A critical analysis of current environmental education programs in forty selected middle and junior high schools of the Connecticut River valley. (Doctoral dissertation, University of Connecticut, 1976). Dissertation Abstracts International, 37(2), 793-A. UMI No. DAH76-14289.

Descriptors: Middle/Junior High, Teacher Education Inservice, Status Study, Program Evaluation, Concepts, Perceptions/Beliefs, Outdoor Education

282. Eastman, T. (1974). The development and validation of an environmental attitude measure with predictive validity. (Doctoral dissertation, University of Maryland, 1973). Dissertation Abstracts International, 35(2), 905-A. UMI No. 74-17039.

Descriptors: Elementary, Affective, Instrument Development, Experimental Research, Unobtrusive Research, Attitudes, Behaviors, Issue-Based

283. Eaton, J.L. (1971). Environmental attitudes and health knowledge of tenth grade high school students. (Doctoral dissertation, The Pennsylvania State University, 1971). Dissertation Abstracts International, 32(5), 2566-A. UMI No. 72-28684.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Descriptive Research, Residence, Gender, Knowledge, Attitudes

284. Ebeling, T.H. (1979). The effects of three teaching strategies on the development of environmental attitudes of selected New Jersey high school students. (Doctoral dissertation, Temple University, 1978). Dissertation Abstracts International, 39(11), 6671-A. UMI No. DEL79-09992.

Descriptors: Secondary, Experimental Research, Lecture, Discussion, Role Playing, Action Learning, Knowledge, Attitudes, Locus of Control/ Efficacy, Science Education

285. Ehrlich, N.J. (1979). A descriptive analysis of teacher awareness concerning energy sources, use, and conservation. (Doctoral dissertation, Oklahoma State University, 1979). Dissertation Abstracts International, 40(6), 3217-A. UMI No. DEL79-28199.

Descriptors: Issue Awareness/Knowledge of Issues, K-12, Teacher Education Inservice, Descriptive Research, Knowledge, Attitudes, Energy Education

286. Ericson, R.K. (1978). Water quality values in outdoor recreation. (Doctoral dissertation, Colorado State University, 1978). Dissertation Abstracts International, 39(5), 3045-A. UMI No. DDK78-20850

Descriptors: Environmental Sensitivity, National Agencies/Programs, Parks/Natural Areas, Social Research, Descriptive Research, Attitudes, Visual Perceptions/Preferences, Outdoor Education

287. Ericsson, C.W. (1978). Appication of expectancy theory of motivation to the energy conservation activities of private citizens. (Doctoral dissertation, University of Tennessee, 1978). Dissertation Abstracts International, 39(3), 1456-B. UMI No. DDK78-15012.

Descriptors: Citizenship Action, Social Research, Descriptive Research, Attitudes, Locus of Control/Efficacy, Verbal Commitment/Intention, Behaviors, Energy Education

288. Esparos, L.J. (1971). An assessment of student attitudes and involvement in the environmental quality program of the Mott Institute - Okemos Secondary School Project. (Doctoral dissertation, Michigan State University, 1971). Dissertation Abstracts International, 32(3), 1219-A. UMI No. 71-23181.

Descriptors: Citizenship Action, Secondary, Program Evaluation, Ex Post Facto Research, Attitudes, Personal Responsibility, Behaviors

289. Fagan, J.S. (1976). Mastery learning: The relationship of mastery procedures and aptitude to the achievement and retention of transportation-environmental concepts by seventh-grade students. (Doctoral dissertation, University of Georgia, 1975). Dissertation Abstracts International, 36(9), 5981-A. UMI No. DAH76-6402.

Descriptors: Issue Awareness/Knowledge of Issues, Middle/Junior High, Cognitive, Program Evaluation, Pre-Experimental Research, Aptitude, Knowledge, Social Studies Education

290. Falk, J.H. (1975). Lawn biology: Ecological and educational strategies. (Doctoral dissertation, University California, Berkeley, 1974). American Doctoral Dissertations, 1973/74, p.179.

Descriptors: Ecology Education, Nature Study, Science Education,

291. Farragher, P. (1980). Learning environmental science from text aided by a diagnostic and prescriptive instructional strategy. (Doctoral dissertation, The Pennsylvania State University, 1980). Dissertation Abstracts International, 41(5), 1917-A. UMI No. DEM80-24445.

Descriptors: Issue Awareness/Knowledge of Issues, Higher Education, Program Evaluation, Experimental Research, Individualized Instruction, Knowledge, Science Education, Social Studies Education

292. Fazio, J.R. (1975). A mandatory permit system and interpretation for backcountry user control in Rocky Mountain National Park: An evaluative study. (Doctoral dissertation, Colorado State University, 1974). Dissertation Abstracts International, 35(8), 5509-A. UMI No. 75-04590.

Descriptors: Parks/Natural Areas, National Agencies/Programs, Program Evaluation, Experimental Research, Text-Based, Media-Based, Behaviors, Issue-Based, Interpretation

293. Feingold, B.H. (1980). The wilderness experience: The interaction of person and environment. (Doctoral dissertation, California School of Professional Psychology, Berkeley, 1979). Dissertation Abstracts International, 40(7), 3364-B. UMI No. DEM80-00914.

Descriptors: Environmental Sensitivity, Wilderness, Social Research, Hypothesis Generation, Gender, Personality Type, Outdoor Education

294. Feldman, R.L. (1975). Effectiveness of audio-visual media for environmental interpretation to recreating motorists. (Doctoral dissertation, Cornell University, 1975). Dissertation Abstracts International, 36(5), 2499-A. UMI No. 75-24180.

Descriptors: Community Resources, Psychomotor, Program Evaluation, Experimental Research, Field Trip, Media-Based, Knowledge, Interpretation

295. Fleetwood, G.R. (1973). The development of The Environmental Science Test and The Environmental Attitude Inventory. (Doctoral dissertation, University of North Carolina at Chapel Hill, 1972). Dissertation Abstracts International, 34(1), 121-A. UMI No. 73-16472.

Descriptors: Ecology Education, Issue Awareness/Knowledge of Issues, Secondary, Instrument Development, Descriptive Research, Knowledge, Attitudes, Science Education

296. Fleming, G.A. (1974). An examination of the relationship between the intents and outcomes of a resident outdoor education experience. (Doctoral dissertation, Northern Illinois University, 1973). Dissertation Abstracts International, 34(8), 4693-A. UMI No. 74-2793.

Descriptors: Camps/Residential Centers, Elementary, Teacher Education

Inservice, Program Development, Program Evaluation, Descriptive Research, Perceptions/Beliefs, Knowledge

297. Foltz, D.C. (1977). A description and analysis of environmental concern in the university student. (Doctoral dissertation, Southern Illinois University at Carbondale, 1976). Dissertation Abstracts International, 37(10), 6154-A. UMI No. DBJ77-26943.

Descriptors: Issue Awareness/Knowledge of Issues, Higher Education, Pre-Experimental Research, Formal, Concern, Perceptions/Beliefs

298. Frederick, C.L. (1974). An analysis of the effects of a specially designed environmental studies course on selected affective characteristics of potential dropouts. (Doctoral dissertation, University of Iowa, 1974). Dissertation Abstracts International, 35(4), 2072-A. UMI No. 74-21889.

Descriptors: Secondary, Affective, Program Evaluation, Experimental Research, Personality Type, Attitudes, Personal Responsibility

299. Fridgen, J.D. (1980). Perceived naturalness as a determinant of responses to landscapes. (Doctoral dissertation, University of California, 1979). Dissertation Abstracts International, 41(2), 595-A. UMI No. DEM80-16756.

Descriptors: Environmental Sensitivity, Social Research, Experimental Research, Attitudes, Beliefs, Visual Perceptions/Preferences

300. Gardella, J.R. (1976). Increasing teacher use and awareness of community resources: An analysis of two strategies. (Doctoral dissertation, Southern Illinois University at Carbondale, 1975). Dissertation Abstracts International, 37(6), 3362-A. UMI No. DAH76-26944.

Descriptors: Community Resources, Teacher Education Inservice, Program Evaluation, Experimental Research, Field Trip, Knowledge

301. Georgi, D.R. (1979). Wilderness as a context for learning: An exploratory study with implications for learning programs involving life meanings, environmental education, and attitudes. (Doctoral dissertation, University of California, Santa Barbara, 1978). Dissertation Abstracts International, 39(11), 6620-A. UMI No. DEL79-11652.

Descriptors: Wilderness, Secondary, Program Development, Theoretical Research, Naturalistic Research, Concepts, Perceptions, Outdoor Education

302. Ghayur, M.A. (1979). A study of the socioeconomic correlates of attitudes towards population issues among Nassau County college students. (Doctoral dissertation, St. John's University, 1978). American Doctoral Dissertations 1977/78, p. 400.

Descriptors: Issue Awareness/Knowledge of Issues; Higher Education, Descriptive Research, Social Background, Economic Background, Attitudes, Population Education

303. Glaze, J.R. (1977). Factors affecting the viability of environmental health and safety programs in institutions of higher education. (Doctoral dissertation, University of Illinois at Urbana-Champaign, 1977). Dissertation Abstracts International, 38(6), 3315-A. UMI No. DBJ77-26669.

Descriptors: Issue Awareness/Knowledge of Issues, Higher Education, Status Study, Descriptive Research, Attitudes

304. Goldstein, J. (1978). The Pine Barrens: A study of environmental decision making. (Doctoral dissertation, City University of New York, 1978). Dissertation Abstracts International, 39(4), 2582-A. UMI No. DDK78-18815.

Descriptors: Citizenship Action, Social Research, Historical Research, Naturalistic Research, Group Membership

305. Gooding, C.W. (1976). Decision making under environmental constraints: A management simulation game. (Doctoral dissertation, University of Georgia, 1976). Dissertation Abstracts International, 37(5), 3011-A. UMI No. DAH76-26474.

Descriptors: Values Clarification Skills, Higher Education, Program Evaluation, Pre-Experimental Research, Simulations, Games, Perceptions/Beliefs, Cognitive Strategies, Issue-Based

306. Gottlieb, J. (1973). The preservation of wilderness values: The politics and administration of conservation policy. (Doctoral dissertation, University of California, Riverside, 1972). Dissertation Abstracts International, 34(1), 396-A. UMI No. 73-15626.

Descriptors: Issue Identification and Analysis Skills, Wilderness, National Agencies/Programs, Model Building, Historical Research, Theoretical Research, Values/Moral Education

307. Green, R.M. (1975). Population growth and justice: An examination of moral issues raised by rapid population growth. (Doctoral dissertation, Harvard University, 1973). American Doctoral Dissertations, 1972/73, p.

434.

Descriptors: Values Clarification Skills, Theoretical Research, Values/ Moral Education, Population Education

308. Greenglass, D.I. (1980). Interaction between cognitive level and structure of presentation on performance: An adult learning situation involving museum artifacts. (Doctoral dissertation, University of Toronto, 1979). Dissertation Abstracts International, 40(12), 6246-A.

Descriptors: Museums, Program Development, Experimental Research, Non-Formal, Personality Type, Concepts, Preferences, Interpretation

309. Grinder, R.D. (1974). The anti-smoke crusades: Early attempts to reform the urban environment, 1893-1918. (Doctoral dissertation, University of Missouri at Columbia, 1973). Dissertation Abstracts International, 35(2), 1007-A. UMI No. 74-18539.

Descriptors: Citizenship Action, Social Research, Social Background, Economic Background, Group Membership, Perceptions/Beliefs, Health Education

310. Haglund, E.J. (1972). Awareness in Japanese education of Japan's dependence upon foreign resources. (Doctoral dissertation, Michigan State University, 1972). Dissertation Abstracts International, 33(6), 2615-A. UMI No. 72-29973.

Descriptors: Issue Awareness/Knowledge of Issues, Cognitive, Program Evaluation, Naturalistic Research, Formal, Knowledge, Resource Management Education, International

311. Hall, W.W. (1973). Some explorations in the theory and measurement of the demand for environmental quality. (Doctoral dissertation, Clemson University, 1972). Dissertation Abstracts International, 34(2), 486-A. UMI No. 73-19258.

Descriptors: Social Research, Model Building, Instrument Development, Theoretical Research, Descriptive Research, Verbal Commitment/Intention

312. Halliwell, B.M. (1972). A method for the content analysis of cartoons: The case of attitudes toward contraception and population growth. (Doctoral dissertation, University of California at Los Angeles). Dissertation Abstracts International, 33(2), 775-A. UMI No. 72-20444.

Descriptors: Issue Awareness/Knowledge of Issues, Document Analysis, Attitudes, Population Education, Communications

313. Hamann, J.M. (1973). Analysis of environmental education in a value-oriented framework. (Doctoral dissertation, United States International University, 1973). Dissertation Abstracts International, 33(7), 3480-A. UMI No. 73-1240.

Descriptors: Elementary, Teacher Education Inservice, Program Evaluation, Experimental Research, Attitudes, Values, Values/Moral Education

314. Hammitt, W.E. (1978). Visual and user preferences for a bog environment. (Doctoral dissertation, University of Michigan, 1978). Dissertation Abstracts International, 39(6), 3833-A. UMI No. 78-22910.

Descriptors: Parks/Natural Areas, Social Research, Program Development, Naturalistic Research, Visual Perceptions/Preferences, Resource Management Education, Interpretation

315. Hanson, J.A. (1974). The Civilian Conservation Corps in the northern Rocky Mountains. (Doctoral dissertation, University of Wyoming, 1973). Dissertation Abstracts International, 34(12), 7677-A. UMI No. 74-13289.

Descriptors: Parks/Natural Areas, National Agencies/Programs, Social Research, Historical Research, Program Evaluation, Conservation Education

316. Harris, J.Q. (1974). Assessing social values held toward the bio-physical environment. (Doctoral dissertation, University of Utah, 1973). Dissertation Abstracts International, 34(7), 3756-A. UMI No. 74-190.

Descriptors: Social Research, Descriptive Research, Social Background, Ethnic Background, Economic Background, Political Views, Gender, Values

317. Harrison, G.W. (1976). An investigation of the role of a private liberal arts college in forstering an environmental consciousness in its students. (Doctoral dissertation, Michigan State University, 1975). Dissertation Abstracts International, 36(12), 6044-B. UMI No. DAH76-12452.

Descriptors: Environmental Sensitivity, Issue Awareness/Knowledge of Issues, Higher Education, Program Evaluation, Ex Post Facto Research, Knowledge, Perceptions/Beliefs, Attitudes, Conservation Education, Science Education

318. Hart, E.P. (1980). Environmental education: Identification of key characteristics and a design for curriculum organization. (Doctoral dissertation, Simon Fraser University, 1979). Dissertation Abstracts International, 40(9), 4985-A.

Descriptors: Model Building, Program Development, Curriculum Development, Document Analysis, Theoretical Research

319. Hartung, J.V. (1974). An evaluation of an experiential stress-challenge environmental education college course. (Doctoral dissertation, Southern Illinois University-Carbondale, 1973). Dissertation Abstracts International, 34(9), 5738-A. UMI No. 74-6206.

Descriptors: Issue Awareness/Knowledge of Issues, Outdoor Classrooms, Higher Education, Program Evaluation, Pre-Experimental Research, Knowledge, Preferences, Outdoor Education

320. Heiser, E.A. (1977). Organization and administration of environmental education programs. (Doctoral dissertation, University of Northern Colorado, 1977). Dissertation Abstracts International, 38(4), 1853-A. UMI No. DBJ77-22370.

Descriptors: K-12, Program Development, Program Implementation, Program Evaluation, Theoretical Research, Formal

321. Herberger, R. A. (1972). The impact of concern for ecological factors on consumer buying behavior. (Doctoral dissertation, University of Colorado, 1971). Dissertation Abstracts International, 32(12), 6608-A. UMI No. 72-17266.

Descriptors: Issue Awareness/Knowledge of Issues, Citizenship Action, Social Research, Experimental Research, Preferences, Behaviors

322. Herr, R.D. (1972). Effectiveness of a program of agriculture in elementary schools with emphases on safety, sanitation, and conservation. (Doctoral dissertation, The Pennsylvania State University, 1972). Dissertation Abstracts International, 33(1), 143-A. UMI No. 72-19319.

Descriptors: Elementary, Middle/Junior High, Program Evaluation, Experimental Research, Gender, Intelligence, Knowledge, Attitudes, Conservation Education, Health Education

323. Hickman, E.W. (1975). The status of the field trip as a method of science instruction in Oklahoma high schools and factors affecting its use. (Doctoral dissertation, University of Arkansas, 1976). Dissertation Abstracts International, 36(6), 3236-A. UMI No. 75-27729.

Descriptors: Outdoor Classrooms, Teacher Education Preservice, Teacher Education Inservice, Descriptive Research, Field Trip, Knowledge, Attitudes, Science Education

324. Hildebrand, R.W. (1973). Emerging and potential state leadership roles in environmental education. (Doctoral dissertation, University of Colorado, 1972). Dissertation Abstracts International, 33(8), 4004-A. UMI No. 73-1782.

Descriptors: State Agencies/Programs, Status Study, Needs Assessment, Master Planning, Descriptive Research, Formal

325. Hodges, S. (1978). An ecological approach to study of zoo visitor behavior: Implications for environmental management and design. (Doctoral dissertation, Virginia Polytechnic Institute and State University, 1978). Dissertation Abstracts International, 39(6), 2963-B. UMI No. DDK78-22709.

Descriptors: Museum, Psychomotor, Program Evaluation, Naturalistic Research, Gender, Age, Preferences, Interpretation

326. Hoff, W.W. (1977). Attitudes toward the energy crisis among selected agricultural groups. (Doctoral dissertation, University of Missouri-Columbia, 1976). Dissertation Abstracts International, 37(9), 5536-A. UMI No. DBJ77-4912.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Teacher Inservice, Descriptive Research, Attitudes, Perceptions/Beliefs, Vocational Education, Energy Education

327. Hogan, M. (1976). Energy conservation: Family values, household practices and contextual variables. (Doctoral dissertation, Michigan State University, 1976). Dissertation Abstracts International, 37(2), 717-B. UMI No. DAH76-18633.

Descriptors: Citizenship Action, Social Research, Prediction Research, Educational Background, Values, Behaviors, Energy Education

328. Holloway, M.A. (1972). Cognitive and affective characteristics of elementary school children toward air, water and soil pollution. (Doctoral dissertation, University of Alabama, 1972). Dissertation Abstracts International, 32(12), 6836-A. UMI No. 72-17107.

Descriptors: Issue Awareness/Knowledge of Issues, Elementary, Instrument Development, Status Study, Descriptive Research, Knowledge, Attitudes, International

329. Holt, L. (1974). Identification of the competencies needed by the classroom teacher in programs of resident outdoor education. (Doctoral dissertation, Ohio University, 1973). Dissertation Abstracts International, 34(12), 7624-A. UMI No. 74-13131.

Descriptors: Camps/Residential Centers, Elementary Education, Teacher Education Preservice, Teacher Education Inservice, Model Building, Program Development, Descriptive Research, Outdoor Education

330. Horn, K.F. (1978). Observations of elementary teachers' perceived needs for environmental education in-service programs. (Doctoral dissertation, University of Oregon, 1977). Dissertation Abstracts International, 39(1), 92-A. UMI No. DDK78-10200.

Descriptors: Elementary, Teacher Education Inservice, Needs Assessment, Program Development, Descriptive Research, Educational Background, Knowledge, Attitudes, Perceptions/Beliefs

331. Hornback, K. (1974). Orbits of opinion: The role of age in the Environmental Movement's attentive public, 1968-1972. (Doctoral dissertation, Michigan State University). Dissertation Abstracts International, 35(6), 3891-A. UMI No. 74-27424.

Descriptors: Social Research, Model Building, Secondary Analysis, Trend Analysis, Educational Background, Economic Background, Age, Perceptions/Beliefs, Attitudes

332. Horsley, A.D. (1975). The effects of a brief "change-agent role-playing" procedure on college geography students' attitude and behavior toward environmental conservation. (Doctoral dissertation, Southern Illinois University - Carbondale, 1974). Dissertation Abstracts International, 35(12), 7747-A. UMI No. 75-13241.

Descriptors: Citizenship Action, Higher Education, Experimental Research, Unobtrusive Research, Role Playing, Social Learning Methods, Attitudes, Behaviors, Geographic Education

333. Horvat, R.E. (1974). Fifth-grade and eighth-grade students' orientations toward the environment and environmental problems. (Doctoral dissertations, University of Wisconsin - Madison, 1974). Dissertation Abstracts International, 35(1), 168-A. UMI No. 74-10248.

Descriptors: Issue Awareness/Knowledge of Issues, Elementary, Middle/Junior High, Descriptive Research, Ethnic Background, Residence, Attitudes, Optimism/Pessimism, Locus of Control/Efficacy, Behaviors

334. Hosley, E.W. (1974). A comparison of two methods of instruction in environmental education. (Doctoral dissertation, University of Maryland, 1974). Dissertation Abstracts International, 35(6), 3392-A. UMI No. 74-29071.

Descriptors: Ecology Education, Elementary, Program Evaluation, Cognitive, Experimental Research, Outdoor Education, Media-Based, Knowledge

335. Hough, O.B. (1979). The relationship of attitude and control orientation to behavior, motivation, and foresight in residential energy management. (Doctoral dissertation, Ohio State University, 1979). Dissertation Abstracts International, 40(1), 187-B. UMI No. DEL79-15987.

Descriptors: Citizenship Action, Social Research, Hypothesis Generation, Descriptive Research, Attitudes, Locus of Control/Efficacy, Behaviors, Energy Education

336. Howell, D.L. (1973). The effects of a student manual on the attitudes of high school students toward environmental protection. (Doctoral dissertation, Ohio State University, 1973). Dissertation Abstracts International, 34(5), 2271-A. UMI No. 73-26841.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Program Evaluation, Experimental Research, Text-Based, Attitudes, Vocational Education, Science Education

337. Howie, T.R. (1973). The effectiveness of outdoor experience versus classroom experience in learning the cognitive dimension of environmental education. (Doctoral dissertation, George Washington University, 1972). Dissertation Abstracts International, 34(1), 122-A. UMI No. 73-16728.

Descriptors: Outdoor Classrooms, Cognitive, Program Evaluation, Experimental Research, Outdoor Education, Concepts, Knowledge

338. Hughes, S.W. (1979). A comparison of the relative effectiveness of a student-directed versus a teacher-directed program of high school environmental science in changing students' attitudes toward the environment. (Doctoral dissertation, Temple University, 1979). Dissertation Abstracts International, 39(11), 6674-A. UMI No. DEL79-10002.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Program Evaluation, Experimental Research, Individualized Instruction, Directed Instruction, Intelligence, Knowledge, Attitudes

339. Hulleman, H.W. (1973). Effects of inservice training on elementary teachers pertaining to science achievement and attitudes toward environmental science. (Doctoral dissertation, Iowa State University, 1972). Dissertation Abstracts International, 33(8), 4007-A. UMI No. 73-3896.

Descriptors: Issue Awareness/Knowledge of Issues, Elementary, Teacher Education Inservice, Program Evaluation, Experimental Research, Field Trips, Knowledge, Attitudes, Science Education

340. Hungerford, N.I. (1979). Relationship of husband/wife ecoconsciousness value to direct household energy consumption. (Doctoral dissertation, Michigan State University, 1978). Dissertation Abstracts International, 39(11), 5334-B. UMI No. DEL79-07350.

Descriptors: Citizenship Action, Social Research, Secondary Analysis, Trend Analysis, Perceptions/Beliefs, Values, Verbal Commitment/Intention, Behaviors, Energy Education

341. Hurford, D.E. (1977). Status of the field trip: A nationwide study of practices and attitudes. (Doctoral dissertation, Temple University, 1977). Dissertatio Abstracts International, 37(12), 7509-A. UMI No. DBJ77-13513.

Descriptors: K-12, Higher Education, Teacher Education Inservice, State Agencies/Programs, Status Study, Descriptive Research, Field Trip, Media-Based

342. Isabell, L.O. (1973). Identification of concepts that will serve as a basis for development of environmental education instructional materials. (Doctoral dissertation, Washington State University, 1972). Dissertation Abstracts International, 33(7), 3424-A. UMI No. 73-56.

Descriptors: Ecology Education, Curriculum Development, Theoretical Research, Interdisciplinary, Concepts, Science Education

343. Jackson, J.Y. (1974). An environmental education plan for Montana. (Doctoral dissertation, University of Montana, 1974). Dissertation Abstracts International, 35(5), 2537-A. UMI No. 74-24011.

Descriptors: K-12, Teacher Education Preservice, Teacher Education Inservice, State Agencies/Programs, Master Planning, Descriptive Research, Multi-Disciplinary, Attitudes, Values, Outdoor Education

344. Jacoby, L.R. (1972). Perception of environmental quality in the city of Detroit: Concern about noise, air, and waste pollution as a function of exposure to pollutants. (Doctoral dissertation, University of Michigan, 1971). Dissertation Abstracts International, 32(7), 4145-A. UMI No. 72-04907. Check UMI No.

Descriptors: Environmental Sensitivity, Issue Awareness/Knowledge of Issues, Social Research, Ex Post Facto Research, Urban, Concern

345. Jinks, J.L. (1975). A theoretical model for a pandisciplinary environmental education curriculum. (Doctoral dissertation, Kansas State University, 1974). Dissertation Abstracts International, 35(9), 5779-A. UMI No. 75-5186.

Descriptors: Teacher Education Inservice, Model Building, Curriculum Development, Program Implementation, Theoretical Research, Multi-Disciplinary, Concepts

346. Johnson, G. (1977). A comparison of eighth-grade pupils' achievement in selected portion of biology using the traditional indoor environment and the experimental outdoor environment taught from an external morphological approach. (Doctoral dissertation, The Pennsylvania State University, 1977). Dissertation Abstracts International, 38(5), 2692-A. UMI No. DBJ77-23244.

Descriptors: Ecology Education, Outdoor Classrooms, Middle/Junior High, Experimental Research, Outdoor Education, Gender, Knowledge, Science Education

347. Johnston, J.B. (1974). A taxonomic and statistical analysis of opinions, attitudes, scope, and selected content areas of environmental education in Mississippi. (Doctoral dissertation, University of Southern Mississippi, 1973). Dissertation Abstracts International, 34(8), 4911-A. UMI No. 74-3938.

Descriptors: Issue Awareness/Knowledge of Issues, Elementary, Teacher Education Inservice, Status Study, Needs Assessment, Descriptive Research, Multi-Disciplinary, Perceptions/Beliefs, Science Education

348. Johnston, R.V. (1977). A paradigm for environmental management. (Doctoral dissertation, University of Southern California, 1976). Dissertation Abstracts International, 38(3), 1649-A.

Descriptors: Issue Investigation and Evaluation Skills, Citizenship Action, Model Building, Theoretical Research, Issue-Based, Resource Management Education

349. Jones, V.A. (1977). A comparative study of environmental education: Competencies of third-grade students and their teachers. (Doctoral dissertation, Michigan State University, 1976). Dissertation Abstracts International, 37(9), 5453-A. UMI No. DBJ77-5831.

Descriptors: Elementary, Teacher Education Inservice, Affective, Status

Study, Descriptive Research, Naturalistic Research, Knowledge, Behaviors

350. Jorgensen, N.D. (1974). Environmental studies in several British junior school classrooms. (Doctoral dissertation, Harvard University, 1972). American Doctoral Dissertations, 1971/72, p. 90.

Descriptors: Middle/Junior High, International

351. Jorgenson, R.G. (1979). Identification of selected science concepts to be used in outdoor education for eleven and twelve year olds in the midwest. (Doctoral dissertation, University of Nebraska, 1978). Dissertation Abstracts International, 39(8), 4717-A. UMI No. 79-01935.

Descriptors: Ecology Education, Elementary, Curriculum Development, Delphi Study, Concepts, Outdoor Education, Science Education

352. Joris, L.F. (1974). An evaluation of a United States Soil Conservation Service "inservice" training center. (Doctoral dissertation, University of Nebraska - Lincoln, 1973). Dissertation Abstracts International, 34(7), 3814-A. UMI No. 74-607.

Descriptors: Adult/Continuing Education, National Agencies/Programs, Program Evaluation, Needs Assessment, Descriptive Research, Conservation Education, Resource Management Education

353. Kahle, R.R. (1975). A Q-methodology study of attitudes toward water resources and implications for using mass media in dissemination of water resources research. (Doctoral dissertation, University of Missouri - Columbia, 1974). Dissertation Abstracts International, 36(1), 13-A. UMI No. 75-16010.

Descriptors: Issue Awareness/Knowledge of Issues, Social Research, Program Development, Descriptive Research, Residence, Age, Attitudes, Optimism/Pessimism, Communications

354. Keating, W.T. (1975). Politics, technology, and the environment: Technology assessment and nuclear energy. (Doctoral dissertation, Indiana University, 1974). Dissertation Abstracts International, 35(10), 6795-A. UMI No. 75-8948.

Descriptors: Issue Identification and Analysis Skills, Citizenship Action, Social Research, Theoretical Research, Energy Education, STS Education

355. Keown, H.D. (1974). The development and evaluation of a curriculum for the Blue Mountain Environmental School. (Doctoral dissertation, Ball

State University, 1974). Dissertation Abstracts International, 35(4), 1462-A. UMI No. 74-20875.

Descriptors: Environmental Sensitivity, Ecology Education, Issue Awareness/Knowledge of Issues, Citizenship Action, Secondary, Curriculum Development, Program Evaluation, Pre-Experimental Research, Field Trip, Knowledge, Concern

356. Kiely, K.A. (1979). An assessment of visitor attitudes towards resource use and management in a National Park. (Doctoral dissertation, Virginia Polytechnic Institute and State University, 1979). Dissertation Abstracts International, 40(5), 2436-B. UMI No. 79-24118.

Descriptors: Parks/Natural Areas, National Agencies/Programs, Social Research, Descriptive Research, Non-Formal, Knowledge, Attitudes, Resource Management Education, Interpretation

357. Kilkenny, J.H. (1978). Minority students at a school of natural resources in a predominantly white university. (Doctoral dissertation, University of Michigan, 1978). Dissertation Abstracts International, 39(2), 739-A. UMI No. DDK78-13681.

Descriptors: Higher Education, Program Evaluation, Descriptive Research, Ethnic Background, Resource Management Education

358. Koeneman, P.A. (1980). Creative approaches for teaching basic concepts of environmental awareness to young children. (Doctoral dissertation, University of Northern Colorado, 1979). Dissertation Abstracts International, 40(11), 5718-A. UMI No. 80-10477.

Descriptors: Environmental Sensitivity, Ecology Education, Early Childhood Education, Program Development, Curriculum Development, Theoretical Research, Concepts, Conservation Education

359. Kostka, M.L. (1975). The impact of selected nature center programs on sixth grade pupils (Volumes I and II). (Doctoral dissertation, University of Minnesota, St. Paul, 1975). Dissertation Abstracts International, 36(3), 1803-A. UMI No. 75-21061.

Descriptors: Environmental/Nature Centers, Elementary, Middle/Junior High, Teacher Education Inservice, Psychomotor, Program Evaluation, Instrument Development, Experimental Research, Residence, Attitudes

360. Kraus, M. (1973). Science education in the National Parks of the United States: A descriptive study of the development of science education programs and facilities by the National Park Service and the relationship of these to the advent of nature study and conservation education in America. (Doctoral dissertation, New York University, 1973).

Dissertation Abstracts International, 34(6), 3178-A. UMI No. 73-30086.

Descriptors: Parks/Natural Areas, National Agencies/Programs, Program Development, Historical Research, Non-Formal, Nature Study, Conservation Education, Science Education

361. Kress, S.W. (1975). A study of the modification of children's attitudes toward animals. (Doctoral dissertation, Cornell University, 1975). Dissertation Abstracts International, 36(5), 2761-A. UMI No. 75-24208.

Descriptors: Elementary, Middle/Junior High, Psychomotor, Program Evaluation, Experimental Research, Lecture, Directed Instruction, Media-Based, Social Learning Methods, Attitudes, Nature Study

362. Lavorgna, G.M. (1979). The assessment of a revised field study program in elementary barrier beach ecology. (Doctoral dissertation, New York University, 1979). Dissertation Abstracts International, 40(5), 2576-A. UMI No. DEL79-25274.

Descriptors: Ecology Education, Elementary, Program Evaluation, Experimental Research, Knowledge, Outdoor Education, Marine Education

363. Leith, S.G. (1974). The development and evaluation of an elementary environmental attitudes program. (Doctoral dissertation, University of Texas at Austin, 1973). Dissertation Abstracts International, 34(9), 5590-A. UMI No. 74-5274.

Descriptors: Values Clarification Skills, Elementary, Teacher Education Preservice, Program Implementation, Experimental Research, Attitudes, Concern

364. Leitko, T.A. (1977). Issues, interests and power: Environmental politics in the community setting. (Doctoral dissertation, University of Delaware, 1977). Dissertation Abstracts International, 38(4), 2355-A. UMI No. DBJ77-22199.

Descriptors: Issue Awareness/Knowledge of Issues, Social Research, Descriptive Research, Community Attributes, Residence, Political Views, Perceptions/Beliefs

365. Leonard-Barton, D.A. (1980). Diffusion of energy conserving practices among California homeowners. (Doctoral dissertation, Stanford University, 1979). Dissertation Abstracts International, 40(7), 3605-A. UMI No. DEM80-01958.

Descriptors: Citizenship Action, Social Research, Descriptive Research, Prediction Research, Educational Background, Perceptions/Beliefs, Behaviors, Energy Education

366. Lepisto, L. (1975). An empirical study of environmental product attributes, convenience, and price on product preference and socially responsible consumer behavior. (Doctoral dissertation, The Pennsylvania State University). Dissertation Abstracts International, 36(3), 1648-A. UMI No. 75-19779.

Descriptors: Citizenship Action, Social Research, Experimental Research, Simulations, Personality Type, Perceptions/Beliefs, Concern, Behaviors

367. Leunes, B.L. (1978). The conservation philosophy of Stewart L. Udall, 1961-1968. (Doctoral dissertation, Texas A&M University, 1977). Dissertation Abstracts International, 38(8), 5006-A. UMI No. DDK77-32170.

Descriptors: Social Research, Historical Research, Knowledge, Perceptions/Beliefs, Values, Conservation Education, Resource Management Education

368. Levenson, H. (1972). Locus of control and other cognitive correlates of involvement in anti-pollution activities. (Doctoral dissertation, Claremont Graduate School, 1972). Dissertation Abstracts International, 33(5), 2325-B. UMI No. 72-30560.

Descriptors: Social Research, Instrument Development, Descriptive Research, Group Membership, Gender, Perceptions/Beliefs, Locus of Control/Efficacy, Behaviors

369. Lewis, R.E. (1975). Widening views of landscape appreciation: A Minnesota case study. (Doctoral dissertation, University of Minnesota, 1974). Dissertation Abstracts International, 35(12), 7814-A. UMI No. 75-12107.

Descriptors: Social Research, Descriptive Research, Visual Perceptions/Preferences

370. Leyden, M.B. (1971). A laboratory oriented course in environmental geology. (Doctoral dissertation, University of Florida, 1970). Dissertation Abstracts International, 32(1), 269-A. UMI No. 71-01098.

Descriptors: Issue Awareness/Knowledge of Issues, Higher Education, Curriculum Development, Theoretical Research, Laboratory-Based, Science Education

371. Littell, R.P. (1974). An assessment of factors related to developing an environmental curriculum in the Community Colleges of California. (Doctoral dissertation, United States International University, 1974). Dissertation Abstracts International, 35(3), 1428-A. UMI No. 74-20527.

Descriptors: Ecology Education, Higher Education, Status Study, Program Development, Descriptive Research, Interdisciplinary, Educational Background, Preferences

372. Little, W.M. (1972). A survey of training programs for auxiliary school personnel in environmental education in New England with emphasis on the role of environmental aides. (Doctoral dissertation, University of Massachusetts, 1972). Dissertation Abstracts International, 32(12), 6717-A. UMI No. 72-18108.

Descriptors: Community Resources, Teacher Education Inservice, Program Development, Program Evaluation, Naturalistic Research, Residence, Gender, Perceptions/Beliefs

373. Littlefield, D.F. (1972). Twentieth century American nature writing: A study of themes and techniques. (Doctoral dissertation, Oklahoma State University, 1971). Dissertation Abstracts International, 33(2), 758-A. UMI No. 72-21927.

Descriptors: Environmental Sensitivity, Historical Research, Attitudes, Nature Study, Language Arts Education, STS Education, Religious Education, Communications

374. Loret, J.H. (1976). A rationale and model for a comprehensive interdisciplinary curriculum in environmental education for grades K-12. (Doctoral dissertation, University of Connecticut, 1976). Dissertation Abstracts International, 36(11), 7163-A. UMI No. DAH76-10261.

Descriptors: K-12, Model Building, Program Development, Theoretical Research, Interdisciplinary, Formal

375. Lounsbury, J. (1974). A community experiment in dissemination models for citizen environmental action. (Doctoral dissertation, Michigan State University, 1973). Dissertation Abstracts International, 34(12), 6196-B. UMI No. 74-13932.

Descriptors: Citizenship Action, Social Research, Model Building, Experimental Research, Attitudes, Behaviors, Communications

376. Lowell, R. (1975). Four attitudes important to environmental education: A study of sub-cultural and socioeconomic differences. (Doctoral dissertation, Rutgers University, 1974). Dissertation Abstracts International, 36(2), 806-A. UMI No. 75-17353.

Descriptors: Social Research, Ex Post Facto Research, Ethnic Background, Economic Background, Attitudes, Locus of Control/Efficacy, Personal Responsibility

377. Lowen, G.H. (1971). A study of elementary education majors' knowledge of conservation concepts and democratic processes at the University of Southern Mississippi, 1971). Dissertation Abstracts International, 32(5), 2532. UMI No. 71-28837.

Descriptors: Elementary, Secondary, Teacher Education Preservice, Descriptive Research, Educational Background, Knowledge, Concepts, Behaviors, Conservation Education

378. Lowenhar, J.A. (1974). Population planning appeals: The effect of source-credibility and fear in terms of the cognitive consistency model. (Doctoral dissertation, Syracuse University, 1973). Dissertation Abstracts International, 34(10), 5172-B. UMI No. 74-8280.

Descriptors: Secondary, Experimental Research, Gender, Personality Type, Knowledge, Attitudes, Population Education, Communications

379. Lucas, A.M. (1973). Environment and environmental education: Conceptual issues and curriculum implications. (Doctoral dissertation, Ohio State University, 1972). Dissertation Abstracts International, 33(11), 6064-A. UMI No. 73-11531.

Descriptors: Citizenship Action, Model Building, Curriculum Development, Theoretical Research, Interdisciplinary, Outdoor Education, Science Education, Social Studies Education

380. Lundstrom, D.F. (1975). Evaluative procedures for an environmental learning program in the primary grades. (Doctoral dissertation, University of California, Berkeley, 1973). American Doctoral Dissertations, 1972/73, p. 138.

Descriptors: Elementary, Program Evaluation, Instrument Development

381. Ludwig, G.S. (1978). Geography and environmental education: A handbook for teachers. (Doctoral dissertation, University of Northern Colorado, 1977). Dissertation Abstracts International, 38(8), 5052-A. UMI No. DDK77-30842.

Descriptors: Middle/Junior High, Teacher Education Inservice, Curriculum Development, Program Evaluation, Descriptive Research, Concepts, Outdoor Education, Science Education, Social Studies Education, Geographic Education

382. Lutts, R.H. (1978). The value orientation of mutuality and its role in environmental studies and environmental education. (Doctoral dissertation, University of Massachusetts, 1978). Dissertation Abstracts International, 39(1), 179-A. UMI No. DDK78-10733.

Descriptors: Values Clarification Skills, Model Building, Theoretical Research, Values/Moral Education, Science Education, Social Studies Education, Religious Education

383. Lynch, F.P. (1974). Growth of environmental awareness in Connecticut and the curriculum response in public secondary schools, 1950-1970. (Doctoral dissertation, University of Connecticut, 1974). Dissertation Abstracts International, 34(7), 3935-A. UMI No. 74-22.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Teacher Education Inservice, State Agencies/Program, Program Development, Historical Research, Science Education, Social Studies Education

384. Lyons, K.P. (1972). A descriptive study of prospective elementary teachers' attitudes relating to environmental problems. (Doctoral dissertation, Indiana University, 1971). Dissertation Abstracts International, 32(8), 4444-A. UMI No. 72-06674.

Descriptors: Issue Awareness/Knowledge of Issues, Elementary, Teacher Education Preservice, Program Evaluation, Pre-Experimental Research, Action Learning, Attitudes, Behaviors

385. MacGregor, B.A. (1979). The use of survival paradigms in environmental education. (Doctoral dissertation, Stanford University, 1979). Dissertation Abstracts International, 40(2), 780-A. UMI No. DEL79-17255.

Descriptors: Issue Investigation and Evaluation Skills, Citizenship Action, Higher Education, Model Building, Naturalistic Research, Cognitive Strategies

386. Mahaffey, B.D. (1973). A study of professional recommendations for curricular guidelines of environmental interpreters. (Doctoral dissertation, Texas A&M University, 1972). Dissertation Abstracts International, 33(8), 4065-A. UMI No. 73-3552.

Descriptors: Teacher Education Preservice, Higher Education, Status Study, Model Building, Program Development, Descriptive Research, Formal, Interpretation

387. Makruski, E.D. (1979). A conceptual analysis of 'Environmental Interpretation'. (Doctoral dissertation, Ohio State University, 1978).

Dissertation Abstracts International, 39(8), 4804-A. UMI No. DEL79-02175.

Descriptors: Model Building, Program Development, Theoretical Research, Non-Formal, Interpretation

388. Mangum, T.E. (1974). A survey of general ecology courses and the preparation and testing of programmed instruction on contemporary environmental problems. (Doctoral dissertation, Ball State University, 1974). Dissertation Abstracts International, 35(4), 2074-A. UMI No. 74-19449.

Descriptors: Ecology Education, Higher Education, Status Study, Needs Assessment, Curriculum Development, Descriptive Research, Text-Based

389. Marlett, B. (1972). The development and field testing of an instrument to measure secondary students' attitudes toward selected environmental education concepts. (Doctoral dissertation, Texas Tech University, 1972). Dissertation Abstracts International, 33(6), 2696-A. UMI No. 72-32056.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Instrument Development, Status Study, Descriptive Research, Concepts, Attitudes, Resource Management Education

390. Mayer, R.N. (1979). The social bases of environmental opinion. (Doctoral dissertation, University of California at Berkeley, 1978). Dissertation Abstracts International, 40(1), 492-A. UMI No. 79-14693.

Descriptors: Issue Identification and Analysis Skills, Social Research, Model Building, Secondary Analysis, Descriptive Research, Educational Background, Economic Background, Political Views, Perceptions/Beliefs

391. McCampbell, D.H. (1979). An investigation of knowledge levels of selected junior high school students in regard to the field of energy cognizance. (Doctoral dissertation, Texas A&M University, 1978). Dissertation Abstracts International, 39(11), 6592-A. UMI No. DEL79-09257.

Descriptors: Issue Awareness/Knowledge of Issues, Middle/Junior High, Descriptive Research, Educational Background, Gender, Knowledge, Energy Education

392. McClelland, J.A. (1971). An approach to the development and assessment of instruction in science at second grade level: The concept of energy. (Doctoral dissertation, Cornell University, 1970). Dissertation Abstracts International, 31(12), 6431-A. UMI No. 71-12134.

Descriptors: Elementary, Program Development, Instrument Development, Pre-Experimental Research, Individualized Instruction, Media-Based, Concepts, Energy Education, Science Education

393. McGaffey, B.A. (1978). Three founders of the British Conservation Movement, 1865-1895: Sir Robert Hunter, Octavia Hill, and Hardwicke Drummond Rawnsley. (Doctoral dissertation, Texas Christian University, 1978). Dissertation Abstracts International, 39(5), 3083-A. UMI No. DDK78-19690.

Descriptors: Environmental Sensitivity, Citizenship Action, Social Research, Historical Research, International

394. McGuiness, J. (1974). Relationships among attitude components, mediating variables, and recycling behavior. (Doctoral dissertation, Texas Christian University, 1973). Dissertation Abstracts International, 34(9), 4707-B. UMI No. 74-5105.

Descriptors: Citizenship Action, Social Research, Model Building, Prediction Research, Unobtrusive Research, Perceptions/Beliefs, Attitudes, Optimism/Pessimism, Behaviors

395. McKechnie, G. (1973). A study of environmental life styles. (Doctoral dissertation, University of California at Berkeley, 1972). Dissertation Abstracts International, 33(9), 4493-B. UMI No. 73-7687.

Descriptors: Social Research, Model Building, Descriptive Research, Prediction Research, Educational Level, Personality Type, Attitudes, Values, Behaviors

396. McKenna, H.J. (1973). An innovative environmental science education program for secondary school science teachers. (Doctoral dissertation, Columbia University, 1973). Dissertation Abstracts International, 34(5), 2443-A. UMI No. 73-25162.

Descriptors: Secondary, Teacher Education Preservice, Program Development, Program Evaluation, Pre-Experimental Research, Knowledge, Behaviors, Science Education

397. Merh, S. (1979). A study of curricular strategies and approaches being developed in population education. (Doctoral dissertation, Lehigh University, 1978). Dissertation Abstracts International, 39(11), 6509-A. UMI No. DEL79-04312.

Descriptors: Teacher Education Preservice, Teacher Education Inservice, Curriculum Development, Program Development, Theoretical Research, Interdisciplinary, Population Education, Global Education

398. Miglierini-Kimyai, V. (1979). An experimental study of the effectiveness of an environmental education program on the expressed attitudes of middle school students. (Doctoral dissertation, Michigan State University, 1978). Dissertation Abstracts International, 39(12), 7268-A. UMI No. DEL79-07367.

Descriptors: Middle/Junior High, Teacher Education Inservice, Program Evaluation, Experimental Research, Knowledge, Attitudes, Behaviors, International

399. Miles, B.M. (1977). A study of factors affecting environmental awareness and opinions of thirteen-college curriculum program students. (Doctoral dissertation, Kansas State University, 1977). Dissertation Abstracts International, 38(6), 3400-A. UMI No. DBJ77-26050.

Descriptors: Ecology Education, Issue Awareness/Knowledge of Issues, Higher Education, Program Development, Descriptive Research, Ethnic Background, Sources of Information, Perceptions/Beliefs, Attitudes

400. Miles, W.R. (1971). Environmental conservation education in Minnesota's colleges and universities. (Doctoral dissertation, University of Minnesota, 1971). Dissertation Abstracts International, 32(3), 1300-A. UMI No. 71-2229.

Descriptors: Higher Education, Adult/Continuing Education, Teacher Education Preservice, Status Study, Program Development, Descriptive Research, Multi-Disciplinary, Attitudes, Conservation Education

401. Miller, D.G. (1979). A study of environmental, social, and self-concept attitude changes in students, through participation in a sixth grade camp program. (Doctoral dissertation, St. Louis University, 1979). Dissertation Abstracts International, 40(5), 2452-A. UMI No. DEL79-23659.

Descriptors: Camps/Residential Centers, Elementary, Middle/Junior High, Program Evaluation, Pre-Experimental Reserch, Attitudes, Concern, Issue-Based, Outdoor Education

402. Minton, T.G. (1980). The history of the nature-study movement and its role in the development of environmental education. (Doctoral dissertation, University of Massachusetts, 1980). Dissertation Abstracts International, 41(3), 967-A. UMI No. DEM80-19480.

Descriptors: Historical Research, Interdisciplinary, Nature Study, Conservation Education, Resource Management Education

403. Mitchell, C.A. (1980). The relationship between principled reasoning and ecological attitudes, knowledge, and behavior. (Doctoral dissertation, University of Arkansas, 1979). Dissertation Abstracts International, 41(5), 1980-B. UMI No. DEM80-26038.

Descriptors: Issue Awareness/Knowledge of Issues, Descriptive Research, Group Membership, Age, Knowledge, Attitudes, Concern, Moral Development, Behaviors

404. Montes, A. (1975). Measuring urban problems and the use of behavioral procedures for the long term maintenance of environmental cleanliness. (Doctoral dissertation, University of Kansas, 1974). Dissertation Abstracts International, 35(9), 4701-B. UMI No. 75-6230.

Descriptors: Social Research, Instrument Development, Pre-Experimental Research, Urban, Behaviors

405. More, M.A. (1979). The effects of interpretation on visitor learning and activity choices in natural areas. (Doctoral dissertation, University of Massachusetts, 1978). Dissertation Abstracts International, 39(8), 3615-B. UMI No. 79-03809.

Descriptors: Museum, Parks/Natural Areas, Program Evaluation, Pre-Experimental Research, Knowledge, Preferences, Nature Study, Interpretation

406. Mortensen, C.O. (1973). Factors involved in determining attitudes toward the environment and its manipulation. (Doctoral dissertation, University of Wisconsin, Madison, 1972). Dissertation Abstracts International, 33(7), 3397-A. UMI No. 72-23752.

Descriptors: Environmental Sensitivity, Wilderness, Social Research, Instrument Development, Descriptive Research, Residence, Urban, Aptitude, Gender, Personal Responsibility, Behaviors

407. Moscati, A.F. (1976). Environmental issues in the siting, construction, and operation of new coal-fired and nuclear power plants. (Doctoral dissertation, University of California, Los Angeles, 1975). Dissertation Abstracts International, 36(10), 4924-B. UMI No. DAH76-9004.

Descriptors: Issue Identification and Analysis, Theoretical Research, Issue-Based, Energy Education

408. Moyer, R.H. (1975). The development and standardization of the Moyer Unobtrusive Survey of Environmental Attitudes. (Doctoral dissertation, University of Northern Colorado, 1975). Dissertation Abstracts International, 36(5), 2731-A. UMI No. 75-23326.

Descriptors: Middle/Junior High, Instrument Development, Theoretical Research, Descriptive Research, Unobtrusive Research, Residence, Attitudes

409. Mulcare, J.R. (1977). An examination of the specific outcomes of the science programs "Interaction of Man and the Biosphere" and "Interaction of Matter and Energy" in the junior high school. (Doctoral dissertation, Northern Illinois University, 1976). Dissertation Abstracts International, 37(12), 7664-A. UMI No. DBJ77-12347.

Descriptors: Middle/Junior High, Program Evaluation, Descriptive Research, Trend Analysis, Inquiry/Investigation, Text-Based, Knowledge, Preferences, Science Education

410. Mullins, G.W. (1979). Participation and non-participation in interpretation: A study of people, places and activities. (Doctoral dissertation, Texas A&M University, 1979). Dissertation Abstracts International, 40(3), 1680-A. UMI No. 79-19090.

Descriptors: Parks/Natural Areas, Psychomotor, Hypothesis Generation, Program Development, Descriptive Research, Group Membership, Interpretation

411. Murphy, E.M. (1979). The implementation of population education: Current status and needs of educators. (Doctoral dissertation, University of Maryland, 1978). Dissertation Abstracts International, 39(8), 4697-A. UMI No. DEL79-03113.

Descriptors: K-12, Teacher Education Preservice, Teacher Education Inservice, Status Study, Needs Assessment, Program Implementation, Historical Research, Descriptive Research, Population Education

412. Nelson, J. (1974). An empirical investigation of the nature and incidence of ecologically responsible consumption of housewives. (Doctoral dissertation, University of Minnesota). Dissertation Abstracts International, 35(6), 3222-A. UMI No. 74-26215.

Descriptors: Issue Awareness/Knowledge of Issues, Citizenship Action, Social Research, Prediction Research, Educational Background, Social Background, Sources of Information, Preferences, Behaviors

413. Nilson, G.E. (1977). Man, wilderness, and environmentalism, A study in the sociology of social movements. (Doctoral dissertation, University of Massachusetts). Dissertation Abstracts International, 38(4), 2353-A. UMI No. 77-22040.

Descriptors: Issue Identification and Analysis Skills, Values Clarification Skills, Citizenship Action, Wilderness, Social Research, Model Building, Theoretical Research, Historical Research, Resource Management Education

414. Noeske, N.R. (1975). A comparative study of the effects of different instructional treatments on elementary pupils' attitudes towards the urban environment. (Doctoral dissertation, University of Maryland, 1974). Dissertation Abstracts International, 35(7), 4273-A. UMI No. 75-1815.

Descriptors: Elementary, Program Evaluation, Experimental Research, Field Trip, Media-Based, Urban, Attitudes, Optimism/Pessimism

415. Nowak, P.J. (1978). The contextual effects of environmental conflict on two models of political participation. (Doctoral dissertation, University of Minnesota, 1977). Dissertation Abstracts International, 39(1), 476-A. UMI No. DDK78-09772.

Descriptors: Citizenship Action, Social Research, Prediction Research, Community Attributes, Social Background, Economic Background, Group Membership, Behaviors

416. Okay, J.L. (1975). An analysis of the Soil Conservation Service Erosion Control Program in Michigan. (Doctoral dissertation, Michigan State University, 1974). Dissertation Abstracts International, 36(1), 432-A. UMI No. 75-14802.

Descriptors: Citizenship Action, National Agencies/Programs, Model Building, Program Evaluation, Secondary Analysis, Conservation Education

417. Orr, R.H. (1973). Community alienation and pollution control. (Doctoral dissertation, University of Illinois at Urbana-Champaign, 1973). Dissertation Abstracts International, 34(2), 874-A. UMI No. 73-17612.

Descriptors: Social Research, Prediction Research, Community Attributes, Political Views, Attitudes, Locus of Control/Efficacy, Optimism/Pessimism, Issue-Based

418. Paquin, T.F. (1973). Documentation and analysis of the development of the Camp Greenough Environmental Education Center, an alternative public school at Yarmouth, Massachusetts. (Doctoral dissertation, University of Massachusetts, 1973). Dissertation Abstracts International, 34(4), 1492-A. UMI No. 73-22808.

Descriptors: Camp/Residential Center, Secondary, Teacher Education Perservice, Teacher Education Inservice, Program Development, Program Implementation, Historical Research, Nature Study, Outdoor Education

419. Parish, R.J. (1974). The design and testing of an instructional model for population and resources education concepts at the community college level. (Doctoral dissertation, Ohio State University, 1973). Dissertation Abstracts International, 34(8), 4711-A. UMI No. 74-3283.

Descriptors: Program Development, Experimental Research, Individualized Instruction, Personality Type, Concepts, Knowledge, Attitudes, Population Education, Resource Management Education

420. Parker, D.C. (1975). An analysis of environmental attitudes as measured by a modified semantic differential instrument. (Doctoral dissertation, Syracuse University, 1974). Dissertation Abstracts International, 35(11), 7142-A. UMI No. 75-10564.

Descriptors: Environmental Sensitivity, Issue Awareness/Knowledge of Issues, K-12, Descriptive Research, Formal, Educational Background, Residence, Attitudes

421. Parsons, M.G. (1975). Attitudes about coal development and the accompanying environment impact in the Decker-Birney Study Area of eastern Montana: Implications for Education. (Doctoral dissertation, Montana State University, 1975). Dissertation Abstracts International, 36(5), 2575-A. UMI No. 75-25756.

Descriptors: Issue Identification and Analysis Skills, Social Research, Prediction Research, Economic Background, Residence, Age, Attitudes, Resource Management Education

422. Pasvolsky, R.D. (1974). Developing environmental perceptivity in early childhood. (Doctoral dissertation, Indiana University, 1973). Dissertation Abstracts International, 34(8), 4578-A. UMI No. 74-2308.

Descriptors: Environmental Sensitivity, Early Childhood, Curriculum Development, Program Evaluation, Pre-Experimental Research, Multi-Disciplinary, Concepts, Perceptions/Beliefs, Outdoor Education

423. Paulsen, M.A. (1979). Effects of three instructional approaches (lecture-only, lecture-laboratory, and lecture delayed-laboratory) on community college students' achievement in a general education environmental science program. (Doctoral dissertation, University of Southern California, 1979). Dissertation Abstracts International, 39(9), 5538-A.

Descriptors: Issue Awareness/Knowledge of Issues, Higher Education, Program Evaluation, Experimental Research, Lecture, Laboratory-Based, Knowledge, Science Education

424. Peden, R.K. (1973). The development and testing of an interdisciplinary environmental education unit for seventh-grade students. (Doctoral dissertation, University if Mississippi, 1972). Dissertation Abstracts International, 33(7), 3267-A. UMI No. 73-1285.

Descriptors: Ecology Education, Issue Awareness/Knowledge of Issues, Middle/Junior High, Program Development, Program Evaluation, Interdisciplinary, Aptitude, Knowledge, Attitudes

425. Perkes, A.C. (1974). A survey of environmental knowledge and attitudes of tenth-grade and twelfth-grade students from five Great Lakes and six far western states. (Doctoral dissertation, Ohio State University, 1973). Dissertation Abstracts International, 34(8), 4914-A. UMI No. 74-3287.

Descriptors: Secondary, Status Study, Descriptive Research, Residence, Gender, Concepts, Knowledge, Attitudes

426. Peters, R.O. (1971). The utilization of field trips and sound film simulations of affect student cognition and concept development. (Doctoral dissertation, University of Rochester, 1971). Dissertation Abstracts International, 32(6), 3161-A. UMI No. 72-00799.

Descriptors: Community Resources, Middle/Junior High, Program Evaluation, Experimental Research, Field Trip, Media-Based, Concepts, Knowledge

427. Pettus, A.M. (1975). Measuring teachers' attitudes concerning certain environmental issues, with implications for environmental education. (Doctoral dissertation, Virginia Polytechnic Institute and State University, 1975). Dissertation Abstracts International, 35(8), 5202-A. UMI No. 75-2685.

Descriptors: Teacher Education Inservice, Instrument Development, Theoretical Research, Descriptive Research, Attitudes, Issue-Based

428. Pick, D.C. (1973). College and university outdoor education centers - Present status and recommendations for the future. (Doctoral dissertation, Indiana University, 1972). Dissertation Abstracts International, 33(8), 4194-A. UMI No. 73-4323.

Descriptors: Environmental/Nature Center, Higher Education, Status Study, Program Development, Decriptive Research, Perceptions/Beliefs, Outdoor Education

429. Platzer, W. (1973). An analysis of ecologically motivated consumer purchase behavior. (Doctoral dissertation, University of Arkansas).

Dissertation Abstracts International. 34(5), 2101-A. UMI No. 73-27445.

Descriptors: Citizenship Action, Social Research, Descriptive Research, Educational Background, Economic Background, Age, Attitudes, Behaviors

430. Potter, B.G. (1973). The Civilian Conservation Corps in New York State: Its social and political impact (1933-). (Doctoral dissertation, State University of New York at Buffalo, 1973). Dissertation Abstracts International. 34(3), 1220-A. UMI No. 73-19226.

Descriptors: Parks/Natural Areas, National Agencies/Programs, Social Research, Historical Research, Program Evaluation, Conservation Education

431. Potts, G.D. (1977). The goals, status, and needs of environmental education in the public schools in Kansas. (Doctoral dissertation, Kansas State University, 1976). Dissertation Abstracts International. 37(9), 5576-A. UMI No. DBJ77-5522.

Descriptors: K-12, Teacher Education Inservice, State Agencies/Programs, Status Study, Needs Assessment, Master Planning, Descriptive Research, Educational Background, Residence, Attitudes

432. Presnell, R.W. (1972). The development and evaluation of an audio-taped program of instruction in learning concepts of ecology and conservation. (Doctoral dissertation, Cornell University, 1971). Dissertation Abstracts International. 32(9), 4927-A. UMI No. 72-08989.

Descriptors: Ecology Education, Elementary, Program Development, Program Evaluation, Experimental Research, Field Trip, Games, Media-Based, Knowledge, Conservation Education

433. Pribble, D.A. (1979). The identification and validation of minimal criteria for the purpose of developing a curriculum for an environmental education program. (Doctoral dissertation, Michigan State University, 1978). Dissertation Abstracts International. 39(7), 4049-A. UMI No. DEL79-00736.

Descriptors: K-12, Model Building, Curriculum Development, Program Development, Program Implementation, Needs Assessment, Theoretical Research, Descriptive Research, Formal, Perceptions/Beliefs

434. Prout, P.F. (1978). General and specific environmental conditions in relation to community education developments in Canada's provinces and territories. (Doctoral dissertation, University of Alberta, 1977). American Doctoral Dissertations. 1976/77, p. 94.

Descriptors: Community Resources

435. Pursell, J.M. (1979). An evaluation of activities designed to train teachers and materials developed to make students aware of the energy problem. (Doctoral dissertation, Oklahoma State University, 1978). Dissertation Abstracts International, 39(8), 4701-A. UMI No. DEL79-03726.

Descriptors: Issue Awareness/Knowledge of Issues, Teacher Education Inservice, Curriculum Development, Program Evaluation, Experimental Research, Text-Based, Knowledge, Energy Education

436. Quinn, R.E. (1974). Evaluation of a technique for clarifying environmental values with high school sophomores. (Doctoral dissertation, Texas A&M University, 1973). Dissertation Abstracts International, 34(10), 6371-A. UMI No. 74-1045.

Descriptors: Values Clarification Skills, Secondary, Program Evaluation, Pre-Experimental Research, Values/Moral Education, Economic Background, Attitudes, Issue-Based

437. Quint, W.C. (1979). Secondary transfer of energy awareness from student to parent based on a home centered activity oriented, energy focused curriculum. (Doctoral dissertation, Temple University, 1978). Dissertation Abstracts International, 39(11), 6676-A. UMI No. DEL79-10017.

Descriptors: Issue Investigation and Evaluation Skills, Secondary, Program Evaluation, Experimental Research, Inquiry/Investigation, Economic Background, Attitudes, Energy Education, Science Education

438. Radel, D.J. (1974). Elite perceptions of population problems and political solutions: Research to guide an elite oriented population education program in Kenya. (Doctoral dissertation, University of Minnesota, 1973). Dissertation Abstracts International, 34(11), 7358-A. UMI No. 74-10568.

Descriptors: Issue Identification and Analysis Skills, Social Research, Program Development, Naturalistic Research, Secondary Analysis, Document Analysis, Knowledge, Perceptions/Beliefs, Population Education, International

439. Rahardjo, P. (1977). Population and health: A study of the relationship between health delivery activities and contraception acceptance in Indonesia. (Doctoral dissertation, University of Pittsburgh, 1977). Dissertation Abstracts International, 38(6), 3760-A. UMI No. DBJ77-21207.

Descriptors: Social Research, Program Evaluation, Needs Assessment, Secondary Analysis, Economic Background, Behaviors, Health Education, Population Education, International

440. Reeves, R.L. (1977). Effects of various models on disinhibition and verbal commitment to perform environmentally sound behavior. (Doctoral dissertation, University of Iowa, 1977). Dissertation Abstracts International, 38(4), 2025-A. UMI No. DBJ77-21163.

Descriptors: Citizenship Action, Secondary, Experimental Research, Lecture, Text-Based, Media-Based, Knowledge, Attitudes, Verbal Commitment, Behaviors

441. Reiger, J.F. (1971). George Bird Grinnel and the development of American conservation. (Doctoral dissertation, Northwestern University, 1970). Dissertation Abstracts International, 31(7), 3483-A. UMI No. 71-01949.

Descriptors: Environmental Sensitivity, Social Research, Historical Research, Conservation Education, Communications

442. Rentsch, W.A. (1974). An instrument to measure the minimal understanding and knowledge possession levels in ten environmental concept categories of an environmentally literate citizenry. (Doctoral dissertation, University of Michigan, 1973). Dissertation Abstracts International, 35(1), 311-A. UMI No. 74-15831.

Descriptors: Ecology Education, Issue Awareness/Knowledge of Issues, Citizenship Action, Elementary, Teacher Education Preservice, Instrument Development, Theoretical Research, Descriptive Research, Concepts, Knowledge

443. Reque, B.R. (1978). The guided tour as mediation between museums and schools: Current practices and a proposed alternative. (Doctoral dissertation, University of Chicago, 1978). Dissertation Abstracts International, 39(4), 2040-A.

Descriptors: Museums, Cognitive, Model Building, Program Development, Theoretical Research, Experimental Research, Field Trip, Knowledge

444. Resnik, A. (1974). An empirical test employing the extended Fishbein model for predicting choice behavior for an environmentally-oriented product. (Doctoral dissertation, Arizona State University). Dissertation Abstracts International, 35(4), 1811-A. UMI No. 74-20832.

Descriptors: Citizenship Action, Social Research, Prediction Research, Attitudes, Verbal Commitment/Intention, Behaviors, Issue-Based

445. Reyburn, J.H. (1974). Factors influencing attendance at interpretive programs at five Indiana state parks. (Doctoral dissertation, Purdue University, 1974). Dissertation Abstracts International, 35(6), 2531-B. UMI No. 74-26769.

Descriptors: Parks/Natural Areas, State Agencies/Programs, Psychomotor, Program Evaluation, Experimental Research, Media-Based, Nature Study, Interpretation

446. Rhodes, T.A. (1978). The museum as a learning environment: A model for the analysis and planning of museum education programs. (Doctoral dissertation, Memphis State University, 1978). Dissertation Abstracts International, 39(3), 1304-A. UMI No. 78-15989.

Descriptors: Museums, Model Building, Program Development, Program Evaluation, Theoretical Research, Non-Formal, Interpretation

447. Riblet, D.C. (1972). Environmental knowledge and opinion scales - Need, design and use: A factor analytic study in test construction. (Doctoral dissertation, University of Florida, 1971). Dissertation Abstracts International, 32(12), 6747-A. UMI No. 72-16649.

Descriptors: Issue Awareness/Knowledge of Issues, Higher Education, Instrument Development, Status Study, Theoretical Research, Descriptive Research, Perceptions/Beliefs, Knowledge

448. Roberts, G. (1978). Population policy and population education. (Doctoral dissertation, Rutgers University, 1977). Dissertation Abstracts International, 38(7), 4076-A. UMI No. DDK77-27959.

Descriptors: Status Study, Program Evaluation, Descriptive Research, Document Analysis, Population Education, International

449. Robinson, S. (1975). Social and environmental influences on littering behavior. (Doctoral dissertation, Georgia Institute of Technology, 1975). Dissertation Abstracts International, 36(2), 951-B. UMI No. 75-17493.

Descriptors: Citizenship Action, Higher Education, Descriptive Research, Experimental Research, Attitudes, Values, Behaviors

450. Rosenfeld, S.B. (1981). Informal learning in zoos: Naturalistic studies of family groups. (Doctoral dissertation, University of California - Berkeley, 1980). Dissertation Abstracts International, 41(7), 3035-A. UMI No. 80-29566.

Descriptors: Museums, Psychomotor, Program Development, Model Building, Naturalistic Reserch, Preferences, Interpretation

451. Sachsman, D.B. (1973). Public relations influence on environmental coverage. (Doctoral dissertation, Stanford University, 1973). Dissertation Abstracts International, 34(3), 1309-A. UMI No. 73-20514.

Descriptors: Program Evaluation, Descriptive Research, Document Analysis, Sources of Information, Issue-Based, Communications

452. Sandman, P.M. (1972). Eco-pornography: Environmental advertising and advertising acceptance in the San Francisco Bay area. (Doctoral dissertation, Stanford University, 1972). Dissertation Abstracts International, 32(12), 6917-A. UMI No. 72-16786.

Descriptors: Social Research, Program Evaluation, Descriptive Reserch, Document Analysis, Sources of Information, Attitudes, Behaviors, Issue-Based, Communications

453. Sarnowski, A. (1975). The development of a technique for the measurement of values as applied to environmental problems. (Doctoral dissertation, State University of New York at Buffalo, 1974). Dissertation Abstracts International, 36(3), 1413-A. UMI No. 75-18839.

Descriptors: Secondary, Instrument Development, Theoretical Research, Descriptive Research, Residence, Gender, Age, Values, Issue-Based

454. Schaefer, D.L. (1972). The states and environmental education. (Doctoral dissertation, Northwestern University, 1972). Dissertation Abstracts International, 33(6), 2623-A. UMI No. 72-32563.

Descriptors: State Agencies/Programs, Status Study, Needs Assessment, Master Planning, Naturalistic Research, Document Analysis, Issue-Based, Communications

455. Schatz, G.C. (1973). Effects of span and discussion intervention methods on the quality of group decision making concerning an expert validated environmental crises prediction problem. (Doctoral dissertation, University of Arizona, 1973). Dissertation Abstracts International, 34(3), 1301-B. UMI No. 73-20653.

Descriptors: Issue Investigation and Evaluation Skills, Higher Education, Program Evaluation, Experimental Reserch, Interdisciplinary, Discussion, Perceptions/Beliefs, Issue-Based

456. Schell, R.L. (1975). A formative evaluation of a multidisciplinary curriculum on environmental issues. (Doctoral dissertation, Temple

University, 1974). Dissertation Abstracts International, 36(6), 3371-A. UMI No. 75-28140.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Curriculum Development, Program Evaluation, Pre-Experimental Research, Interdisciplinary, Knowledge, Attitudes, Science Education, Social Studies Education

457. Scholfield-Sweet, K.L. (1979). An environmental questioning strategy: An interdisciplinary model for increasing awareness of place. (Doctoral dissertation, University of Oregon, 1978). Dissertation Abstracts International, 39(10), 5882-A. UMI No. DEL79-07503.

Descriptors: Environmental Sensitivity, Model Building, Program Development, Theoretical Research, Interdisciplinary, Discussion, Visual Perceptions/Preferences

458. Schroeder, H.W. (1980). The effect of perceived conflict on evaluations of natural resource management goals. (Doctoral dissertation, University of Arizona, 1980). Dissertation Abstracts International, 41(2), 676-B. UMI No. DEM80-17801.

Descriptors: Issue Investigation and Evaluation Skills, Social Research, Experimental Research, Cognitive Strategies, Perceptions/Beliefs, Preferences, Values, Resource Management Education

459. Sharma, R.C. (1974). Population trends and resources in India - A source book for teachers of secondary schools. (Doctoral dissertation, Columbia University, 1974). Dissertation Abstracts International, 35(6), 3545-A. UMI No. 74-26619.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Teacher Education Inservice, Curriculum Development, Theoretical Research, Interdisciplinary, Population Education, International

460. Sharma, S.P. (1974). A study of the influence of a curriculum in occupational exploration in agribusiness and natural resources, and other related factors on the occupational knowledge of ninth-grade vocational agriculture students. (Doctoral dissertation, University of Minnesota, 1973). Dissertation Abstracts International, 34(11), 7123-A. UMI No. 74-10585.

Descriptors: Middle/Junior High, Secondary, Teacher Education Inservice, Program Evaluation, Pre-Experimental Research, Residence, Knowledge, Vocational Education

461. Sharron, M.M. (1972). The problems of environmental management: A manual designed for group discussion, including a preliminary program of evaluation. (Doctoral dissertation, New York University, 1972). Dissertation Abstracts International, 33(1), 138-A. UMI No. 72-20685.

Descriptors: Issue Awareness/Knowledge of Issues, Citizenship Action, Secondary, Higher Education, Adult/Continuing Education, Curriculum Development, Program Evaluation, Descriptive Research, Group Membership

462. Sheldon, D.S. (1973). An analysis of the effects of an environmental program upon the participants enrolled. (Doctoral dissertation, University of Iowa, 1973). Dissertation Abstracts International, 34(6), 2936-A. UMI No. 73-30983.

Descriptors: Higher Education, Program Evaluation, Experimental Research, Economic Background, Concepts, Knowledge, Attitudes, Issue-Based, Science Education

463. Shelton, R.L. (1974). The environmental era: A chronological guide to policy and concepts, 1962-1972. (Doctoral dissertation, Cornell University, 1973). Dissertation Abstracts International, 34(10), 6577-A. UMI No. 74-6322.

Descriptors: National Agencies/Programs, Historical Reserch, Concepts, Concern

464. Sherraden, M.W. (1980). The Civilian Conservation Corps: Effectiveness of the camps. (Doctoral dissertation, University of Michigan, 1979). Dissertation Abstracts International, 40(1), 5619-A. UMI No. DEM80-07837.

Descriptors: National Agencies/Programs, Social Research, Program Evaluation, Historical Research, Community Attributes, Residence, Perceptions/Beliefs, Conservation Education, Vocational Education

465. Shifferd, K.D. (1974). The origins of modern environmental thought: A study of the writings of Daniel Defoe, Denis Diderot and Karl Marx. (Doctoral dissertation, Northern Illinois University, 1974). Dissertation Abstracts International, 35(6), 3656-A. UMI No. 74-24632.

Descriptors: Social Research, Historical Research, Optimism/Pessimism, STS Education

466. Shoemaker, F.H. (1975). The development and testing of selected field exercises for the study of ecology at the secondary level. (Doctoral dissertation, University of Mississippi, 1974). Dissertation Abstracts International, 35(7), 4141-A. UMI No. 75-529.

Descriptors: Ecology Education, Secondary, Curriculum Development, Program Evaluation, Experimental Research, Outdoor Education, Concepts, Knowledge, Science Education

467. Sibley, W.A. (1974). The effects of simulation games on attitudes of sixth-graders toward the environment. (Doctoral dissertation, University of Virginia, 1974). Dissertation Abstracts International, 35(4), 2075-A. UMI No. 74-23251.

Descriptors: Issue Awareness/Knowledge of Issues, Elementary, Middle/ Junior High, Program Evalution, Experimental Research, Simulations, Games, Attitudes

468. Sikes, W.N. (1973). A study of the nature and effectiveness of the teaching of environmental problems to gifted science students in Texas Public Schools. (Doctoral dissertation, University of Texas at Austin, 1972). Dissertation Abstracts International, 34(2), 635-A. UMI No. 73-18497.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Teacher Education Inservice, Descriptive Research, Community Attributes, Residence, Knowledge, Concern, Science Education

469. Sim, A.L. (1975). Factors to be considered in developing resources for resident centers for outdoor/environmental education. (Doctoral dissertation, Teacher's College, Columbia University, 1975). Dissertation Abstracts International, 36(3), 1230-A. UMI No. 75-20229.

Descriptors: Camps/Residential Centers, Elementary, Model Building, Needs Assessment, Program Development, Descriptive Research, Outdoor Education

470. Simmons, J.B. (1975). An evaluation of values clarification techniques with respect to ecological achievement and attitudes. (Doctoral dissertation, University of Northern Colorado, 1974). Dissertation Abstracts International, 35(9), 5953-A. UMI No. 75-5438.

Descriptors: Ecology Education, Secondary, Program Evaluation, Experimental Research, Values/Moral Education, Knowledge, Attitudes, Science Education

471. Slapar, T.J. (1980). The knowledge of Indiana chemistry teachers related to environmental phenomena. (Doctoral dissertation, Indiana State University, 1980). Dissertation Abstracts International, 41(6), 2541-A. UMI No. DEM80-29175.

Descriptors: Issue Awareness/Knowledge of Issues, Teacher Education

Inservice, Prediction Research, Disciplinary, Educational Background, Concepts, Knowledge, Science Education

472. Slater, D.P. (1973). The effect of an outdoor experience on sixth-grade students' cognitive understanding of ecological concepts. (Doctoral dissertation, University of New Mexico, 1972). Dissertation Abstracts International, 34(1), 182-A. UMI No. 73-16582.

Descriptors: Ecology Education, Elementary, Middle/Junior High, Program Evaluation, Experimental Research, Field Trip, Concepts, Knowledge, Outdoor Education

473. Smith, D.C. (1979). Construction and validation of an attitudinal scale to assess attitudes toward environmental issues. (Doctoral dissertation, University of Virginia, 1978). Dissertation Abstracts International, 40(4), 2019-A. UMI No. DEL79-16349.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Instrument Development, Theoretical Research, Perceptions/Beliefs, Attitudes

474. Smith, J.L. (1979). The evaluation of a model energy awareness and conservation inservice program for Oklahoma driver education teachers. (Doctoral dissertation, Oklahoma State University, 1978). Dissertation Abstracts International, 39(12), 7143-A. UMI No. DEL79-12651.

Descriptors: Issue Awareness/Knowledge of Issues, Higher Education, Teacher Education Preservice, Program Evaluation, Experimental Research, Knowledge, Attitudes, Energy Education

475. Smith, K.L. (1977). The clash of values in ecological decision-making: West Virginia legislators and the movement to abolish the strip mining of coal. (Doctoral dissertation, The Johns Hopkins University, 1977). Dissertation Abstracts International, 38(3), 1696-A. UMI No. DBJ77-19607.

Descriptors: Issue Indentification and Analysis Skills, Social Research, Historical Research, Social Background, Economic Background, Perceptions/Beliefs, Values, Locus of Control/Efficacy, Behaviors

476. Soffar, A.J. (1975). Differing views on the Gospel of Efficiency: Conservation controversies between Agriculture and Interior, 1898-1938. (Doctoral dissertation Texas Tech University, 1974). Dissertation Abstracts International, 35(11), 7237-A. UMI No. 75-7430.

Descriptors: National Agencies/Programs, Social Research, Historical Research, Perceptions/Beliefs, Conservation Education, Resource Management Education

477. Solid, M.L. (1972). The use of a comparative analysis as an evaluation of a junior high school conservation education program. (Doctoral dissertation, University of Colorado, 1971). Dissertation Abstracts International, 32(8), 4496-A. UMI No. 72-03706.

Descriptors: Middle/Junior High, Secondary, Program Evaluation, Ex Post Facto Research, Economic Background, Residence, Knowledge, Attitudes, Conservation Education

478. Sparks, P.M. (1974). The development and field testing at the junior high school level of an environmental education guidebook. (Doctoral dissertation, Temple University, 1974). Dissertation Abstracts International, 35(6), 3309-A. UMI No. 74-28207.

Descriptors: Issue Awareness/Knowledge of Issues, Issue Investigation and Evaluation Skills, Community Resources, Middle/Junior High, Curriculum Development, Program Evaluation, Pre-Experimental Research, Action Learning, Attitudes, Personal Responsibility

479. St. George, A.W. (1976). The Sierra Club, organizational commitment, and the environmental movement in the United States. (Doctoral dissertation, University of California at Davis, 1974). American Doctoral Dissertations, 1974/75, p. 418.

Descriptors: Social Research, Group Membership, Verbal Commitment

480. Steinberg, H. (1977). Relationships between level of personality development and individuals' environmental value orientations. (Doctoral dissertation, California School of Professional Psychology, Los Angeles, 1976). Dissertation Abstracts International, 37(10), 5445-B. UMI No. 77-6582.

Descriptors: Environmental Sensitivity, Higher Education, Descriptive Research, Age, Personality Type, Attitudes, Values

481. Stevens, F.I. (1974). Application of the CSE Evaluation Model to the evaluation of an ecology program: A case study. (Doctoral dissertation, University of California, Los Angeles, 1973). Dissertation Abstracts International, 34(11), 7057-A. UMI No. 74-11575.

Descriptors: Ecology Education, Elementary, Needs Assessment, Program Development, Program Implementation, Program Evaluation, Experimental Research, Naturalistic Research, Ethnic Background, Knowledge

482. Storm, G.A. (1976). Philosophical perspectives on environmental education. (Doctoral dissertation, University of Illinois at Urbana-

Champaign, 1976).
Dissertation Abstracts International, 37(5), 2713-A. UMI No. DAH76-24183.

Descriptors: Values Clarification Skills, Community Resources, Secondary, Teacher Education Inservice, Curriculum Development, Theoretical Research, Concepts, Values, Behaviors

483. Supadhiloke, B. (1977). Mass communication and knowledge and attitude gaps about population and family planning in a developing urban society. (Doctoral dissertation, University of Wisconsin - Madison, 1976). Dissertation Abstracts International, 37(7), 3976-A. UMI No. DBJ76-23347.

Descriptors: Social Research, Prediction Research, Educational Background, Economic Background, Urban, Sources of Information, Knowledge, Attitudes, Population Education, Communications, International

484. Sweeney, R.E. (1974). World environmental concerns: A social studies unit. (Doctoral dissertation, Carnegie-Mellon University, 1974). Dissertation Abstracts International, 35(6), 3613-A. UMI No. 74-26654.

Descriptors: Issue Awareness/Knowledge of Issues, Values Clarification Skills, Middle/Junior High, Affective, Curriculum Development, Program Evaluation, Pre-Experimental Research, Knowledge, Social Studies Education, Global Education

485. Taylor, D.C. (1975). Population education for Nepal. (Doctoral dissertation, Harvard University, 1973). American Doctoral Dissertations, 1972/73, p. 448.

Descriptors: Population Education, International

486. Thies, G.L. (1975). Leader's manual for operations and innovations in outdoor education camps and environmental centers. (Doctoral dissertation, University of Northern Colorado, 1974). Dissertation Abstracts International, 35(9), 5953-A. UMI No. 75-05445.

Descriptors: Camps/Residential Centers, Environmental/Nature Centers, Teacher Education Preservice, Teacher Education Inservice, Program Development, Naturalistic Research, Interdisciplinary, Inquiry/Investigation, Outdoor Education

487. Tillman, R.E. (1973). The role, status and training of natural resource technicians in New York State. (Doctoral dissertation, Cornell University, 1972). Dissertation Abstracts International, 33(10), 5419-A. UMI No. 73-10149.

Descriptors: Higher Education, Status Study, Curriculum Development, Descriptive Research, Gender, Resource Management Education

488. Tillock, H.E. (1976). Group size and contributions to collective action: A test of Mancur Olson, Jr.'s theory on Zero Population Growth, Inc. (Doctoral dissertation, Michigan State University, 1976). Dissertation Abstracts International, 37(6), 3928-A. UMI No. DAH76-27158.

Descriptors: Citizenship Action, Social Research, Descriptive Research, Group Membership, Values, Moral Development, Population Education

489. Tisdale, J.C. (1978). The development of criteria for the assessment of the comprehensiveness of a school district's continuing outdoor education program. (Doctoral dissertation, Michigan State University, 1977). Dissertation Abstracts International, 39(1), 105-A. UMI No. 78-10124.

Descriptors: K-12, Camps/Residential Centers, Model Building, Curriculum Development, Program Evaluation, Descriptive Research, Formal, Perceptions/Beliefs, Outdoor Education

490. Traweek, D.E. (1978). Visitor employed photography on the Huron River: A tool for interpretive planning. (Doctoral dissertation, Ohio State University, 1977). Dissertation Abstracts International, 38(11), 6933-A. UMI No. DDK78-06217.

Descriptors: Parks/Natural Areas, Program Development, Experimental Research, Document Analysis, Non-Formal, Visual Perceptions/Preferences, Interpretation

491. Trent, R.B. (1975). Attitudes towards population growth and antinatalist policy in 1965. (Doctoral dissertation, University of Washington, 1974). Dissertation Abstracts International, 36(6), 4060-A. UMI No. 75-28451.

Descriptors: Secondary Analysis, Educational Background, Ethnic Background, Economic Background, Age, Gender, Attitudes, Issue-Based, Population Education

492. Trollinger, I.R. (1978). A study of the use of simulation games as a teaching technique with varying achievement groups in a high school biology classroom. (Doctoral dissertation, University of North Carolina at Chapel Hill, 1977). Dissertation Abstracts International, 39(1), 107-A. UMI No. 78-10518.

Descriptors: Secondary, Program Evaluation, Experimental Research, Multi-Disciplinary, Lecture, Discussion, Simulations, Games, Knowledge, Preferences, Science Education

493. Tucker, L.R. (1976). Deepening the concept of marketing: An empirical investigation of selected correlates of individual environmental responsibility. (Doctoral dissertation, The Pennsylvania State University, 1975). Dissertation Abstracts International, 36(11), 7528-A. UMI No. DAH76-10805.

Descriptors: Citizenship Action, Social Research, Prediction Research, Social Background, Economic Background, Group Membership, Age, Attitudes, Locus of Control/Efficacy, Personal Responsibility, Behaviors

494. Turner, J.M. (1975). An investigation of factors affecting curriculum in air pollution technology programs. (Doctoral dissertation, University of Florida, 1974). Dissertation Abstracts International, 36(3). 1283-A. UMI No. 75-19401.

Descriptors: Higher Education, Adult/Continuing Education, Program Development, Descriptive Research, Delphi Study, Concepts, Perceptions/Beliefs, Vocational Education

495. Ulgado, A.V. (1973). Towards family life education for population change: A conceptual model for educational innovation in the Philippines. (Doctoral dissertation, Florida State University, 1973). Dissertation Abstracts International, 33(11), 6473-A. UMI No. 73-11326.

Descriptors: Teacher Education Inservice, Model Building, Curriculum Development, Program Development, Theoretical Research, Knowledge, Attitudes, Behaviors, Population Education, International

496. Ulrich, H.C. (1974). An analysis of the value, utilization, and incorporation of objectives for environmental education in the State of Washington. (Doctoral dissertation, Washington State University, 1974). Dissertation Abstracts International, 35(1), 150-A. UMI No. 74-16402.

Descriptors: K-12, Teacher Education Inservice, State Agencies/Programs, Status Study, Needs Assessment, Master Planning, Curriculum Development, Descriptive Research, Perceptions/Beliefs, Knowledge

497. Vincent, H.A. (1976). The current status of environmental studies programs and environmental education in colleges and universities of nine selected southeastern states. (Doctoral dissertation, University of Southern Mississippi, 1976). Dissertation Abstracts International, 37(4), 2097-A. UMI No. DAH76-23035.

Descriptors: Higher Education, Teacher Education Perservice, Status Study, Program Implementation, Descriptive Research, Vocational Education

498. Vogl, R.L. (1974). Selected Illinois high school superintendents' assessments of citizen action roles for seniors seeking environmental reforms. (Doctoral dissertation, University of Michigan, 1973). Dissertation Abstracts International, 35(1), 304-B. UMI No. 74-15887.

Descriptors: Citizenship Action, Secondary, Program Development, Descriptive Research, Community Attributes, Personality Type, Perferences, Issue-Based

499. Vogl, S.M. (1974). Attitude change in inservice teachers toward the Great Lakes Region in response to lectures or individualized inquiry and retrieval. (Doctoral dissertation, University of Michigan, 1973). Dissertation Abstracts International, 35(1), 305-B. UMI No. 74-15888.

Descriptors: Teacher Education Inservice, Program Evaluation, Experimental Research, Lecture, Inquiry/Investigation, Perceptions/Beliefs, Attitudes, Issue-Based

500. Votaw, T.A. (1979). A comparative review of selected elementary school science kits for environmentally related concepts. (Doctoral dissertation, New Mexico State University, 1979). Dissertation Abstracts International, 39(11), 6517-A. UMI No. DEL79-09473.

Descriptors: Ecology Education, Issue Awareness/Knowledge of Issues, Elementary, Program Evaluation, Document Analysis, Field Trip, Games, Laboratory-Based, Discussion, Concepts, Science Education

501. Wachtel, E.F. (1975). Opening one's eyes: Appraisal of environmental dangers and ability to cope. (Doctoral dissertation, New York University, 1974). Dissertation Abstracts International, 35(7), 3602-B. UMI No. 74-30054.

Descriptors: Issue Awareness/Knowledge of Issues, Higher Education, Experimental Research, Media-Based, Political Views, Perceptions/Beliefs, Knowledge, Attitudes, Concern, Locus of Control/Efficacy

502. Wade, J.E. (1979). Human society within ecosystems: An integration of biophysical and social reality. (Doctoral dissertation, University of Missouri - Columbia, 1978). Dissertation Abstracts International, 39(8), 5175-A. UMI No. DEL79-03944.

Descriptors: Ecology Education, Issue Awareness/Knowledge of Issues, Citizenship Action, Model Building, Program Development, Theoretical Research, Interdisciplinary, Futures Education

503. Wade, R.L. (1973). An exploratory study of professional versus public opinions and priorities in environmental health-management. (Doctoral dissertation, University of Michigan, 1973). Dissertation Abstracts International, 34(4), 1616-B. UMI No. 73-24710.

Descriptors: Issue Awareness/Knowledge of Issues, Descriptive Research, Educational Background, Economic Background, Age, Perceptions/Beliefs, Attitudes, Health Education

504. Walkosz, V.A. (1972). A study of environmental/ecological education programs in the elementary grades in selected cities in Illinois. (Doctoral dissertation, Northern Illinois University, 1972). Dissertation Abstracts International, 33(5), 1997-A. UMI No. 72-29326.

Descriptors: Ecology Education, Issue Awareness/Knowledge of Issues, Elementary, Teacher Education Inservice, Status Study, Curriculum Development, Descriptive Research, Interdisciplinary, Field Trip, Media-Based, Urban

505. Walser, W.M. (1974). Environmental education, kindergarten through grade twelve: A resource guide for teachers. (Doctoral dissertation, Duke University, 1973). Dissertation Abstracts International, 34(9), 5608-A. UMI No. 74-7574.

Descriptors: Ecology Education, Issue Awareness/Knowledge of Issues, Outdoor Classrooms, K-12, Teacher Education Preservice, Status Study, Curriculum Development, Theoretical Research, Field Trip, Inquiry/Investigation

506. Wascoe, N.E. (1979). Effects of noxiousness, efficacy of individual efforts, and implied personal responsibility associated with an energy crisis upon attitudes, behavioral intentions, and behavior regarding energy conservation. (Doctoral dissertation, University of Colorado at Boulder, 1978). Dissertation Abstracts International, 39(8), 4111-B. UMI No. DEL79-03098.

Descriptors: Environmental Sensitivity, Citizenship Action, Social Research, Experimental Research, Attitudes, Personal Responsibility, Behaviors, Energy Education, Communications

507. Washington, G.C. (1979). The response of selected higher education institutions to the environmental crisis. (Doctoral dissertation, Indiana University, 1978). Dissertation Abstracts International, 39(9), 5365-A. UMI No. DEL79-06038.

Descriptors: Higher Education, Status Study, Program Development, Descriptive Research, Ethnic Background, Perceptions/Beliefs, Science Education

508. Weiss, I.R. (1975). The development and evaluation of a self-instructional environmental education program for elementary teachers.

(Doctoral dissertation, University of North Carolina, 1974). Dissertation Abstracts International, 36(1), 236-A. UMI No. 75-15717.

Descriptors: Ecology Education, Elementary, Teacher Education Inservice, Program Development, Program Evaluation, Experimental Research, Individualized Instruction, Concepts, Knowledge, Attitudes, Science Education

509. Wert, J. (1975). A process model showing how a Federal Government Agency such as the Tennessee Valley Authority, can utilize its resources to cooperate with other Agencies in the development of environmental education programs for the Tennessee Valley Region. (Doctoral dissertation, University of Alabama, 1974). Dissertation Abstracts International, 35(11), 5472-B. UMI No. 75-9955.

Descriptors: National Agencies/Programs, Model Building, Program Development, Program Implementation, Program Evaluation, Theoretical Research

510. Wescott, D.C. (1975). A comparison of two methods of teaching environmental education. (Doctoral dissertation, University of Maryland, 1974). Dissertation Abstracts International, 36(2), 807-A. UMI No. 75-17916.

Descriptors: Issue Awareness/Knowledge of Issues, Middle/Junior High, Program Evaluation, Experimental Research, Interdisciplinary, Disciplinary, Knowledge, Attitudes

511. Westwater, J.N. (1973). A wide-screen multi-image presentation used as a multidimensional resource for environmental education: A study of teacher-user perceptions. (Doctoral dissertation, Ohio State University, 1972). Dissertation Abstracts International, 33(8), 3976-A. UMI No. 73-2159.

Descriptors: K-12, Teacher Education Inservice, Program Evaluation, Needs Assessment, Pre-Experimental Research, Discussion, Media-Based, Perceptions/Beliefs

512. White, C. (1973). Effects of conservation workshops on teachers. (Doctoral dissertation, Cornell University, 1973). Dissertation Abstracts International, 34(3), 1173-A. UMI No. 73-22539.

Descriptors: Issue Awareness/Knowledge of Issues, Teacher Education Inservice, Psychomotor, Program Evaluation, Pre-Experimental Research, Ex Post Facto Research, Unobtrusive Research, Group Membership, Attitudes, Perceptions/Beliefs, Conservation Education

513. Wilkinson, P. (1977). Public participation and environmental management:

The role of public participation and public interest groups in environmental quality management. (Doctoral dissertation, University of Toronto, 1974). Dissertation Abstracts International, 37(12, part 1), 7971-A.

Descriptors: Citizenship Action, Social Research, Descriptive Research, Group Membership, Perceptions/Beliefs, Attitudes, Behaviors, Resource Management Education

514. Williams, L.D. (1977). Julian Warner Smith: His life, professional career and contributions to outdoor education. (Doctoral dissertation, East Texas State University, 1976). Dissertation Abstracts International, 37(11), 7312-A. UMI No. DBJ77-9638.

Descriptors: Camps/Residential Centers, Social Research, Historical Research, Outdoor Education

515. Windley, P.G. (1973). Environmental dispositions of older people. (Doctoral dissertation, University of Michigan, 1972). Dissertation Abstracts International, 34(4), 1737-B. UMI No. 73-21203.

Descriptors: Higher Education, Social Research, Model Building, Instrument Development, Descriptive Research, Age, Preferences, Attitudes

516. Winston, B.J. (1974). The relationship of awareness to concern for environmental quality among selected high school students. (Doctoral dissertation, Northwestern University, 1974). Dissertation Abstracts International, 35(6), 3412-A. UMI No. 74-28782.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Teacher Education Preservice, Curriculum Development, Descriptive Research, Urban, Attitudes, Concern, Behaviors

517. Winter, L.R. (1978). An expository analysis of selected naturalists' life styles, environmental beliefs, and contributions to environmental awareness. (Doctoral dissertation, University of Northern Colorado, 1977). Dissertation Abstracts International, 38(11), 6416-A. UMI No. DDK78-05529.

Descriptors: Environmental Sensitivity, Issue Identification and Analysis Skills, Historical Research, Perceptions/Beliefs, Values, Behaviors, Nature Study

518. Wong, O.K. (1978). A structural analysis of a guided investigation of energy by an eleven-year-old student with implications for teaching science. (Doctoral dissertation, University of Illinois at Urbana-Champaign, 1977). Dissertation Abstracts International, 38(10), 6043-A. UMI No. DDK78-04198.

Descriptors: Elementary, Curriculum Development, Naturalistic Research, Inquiry/Investigation, Text-Based, Concepts, Knowledge, Energy Education, Science Education

519. Wright, J.H. (1972). The effect of a television-oriented inservice program on the elementary teachers' attitudes toward some components of environmental education. (Doctoral dissertation, University of Denver, 1971). Dissertation Abstracts International, 32(10), 5662-A. UMI No. 72-12661.

Descriptors: Ecology Education, Elementary, Teacher Education Inservice, Program Evaluation, Experimental Research, Media-Based, Educational Background, Concepts, Attitudes, Issue-Based

520. Wyatt, R.C. (1977). Exploring organizational attempts to affect environmental policy in an urban area: An analysis of the basis for success or failure. (Doctoral dissertation, University of Texas at Austin, 1976). Dissertation Abstracts International, 37(8), 5374-A. UMI No. DBJ77-4004.

Descriptors: Citizenship Action, Social Research, Model Building, Descriptive Research, Urban, Group Membership, Values, Behaviors, Issue-Based

521. Yoon, S.H. (1980). Population problems and role of Church in Korea. (Doctoral dissertation, School of Theology at Claremont, 1980). Dissertation Abstracts International, 41(3), 1229-A. UMI No. DEM80-19020.

Descriptors: Social Research, Theoretical Research, Values, Moral Development, Issue-Based, Population Education, Religious Education, International

522. Zacher, L.J. (1975). A study of factors affecting the knowledge of eleventh-grade students in Montana. (Doctoral dissertation, University of Montana, 1974). Dissertation Abstracts International, 35(8), 4883-A. UMI No. 75-96.

Descriptors: Secondary, Hypothesis Generation, Descriptive Research, Educational Background, Residence, Gender, Sources of Information, Knowledge

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523. Adefuye, B.O. (1986). Correlates of the adoption of soil conservation practices by Iowa farmers. (Doctoral dissertation, Iowa State University, 1985). Dissertation Abstracts International, 46(12), 3881-A. UMI No. DES86-04440.

Descriptors: Citizenship Action, Social Research, Educational Background, Economic Background, Residence, Behaviors, Conservation Education

524. Adeniyi, E.O. (1984). An analysis of the relationship among intended curriculum, in-use curriculum, and students' cognitive structures associated with an ecology unit. (Doctoral dissertation, University of Wisconsin - Madison, 1983). Dissertation Abstracts International, 44(9), 2662-A. DEQ83-23038.

Descriptors: Ecology Education, Secondary, Teacher Education Inservice, Program Implementation, Program Evaluation, Naturalistic Research, Text-Based, Concepts, Knowledge, Science Education, International

525. Agno, E.E. (1981). A proposed model on energy education for national development of the Philippines with emphasis on the planning and implementation roles of vocational-technical education. (Doctoral dissertation, Florida State University, 1980). Dissertation Abstracts International, 41(12), 5072-A. UMI No. DEN81-11926.

Descriptors: Model Building, Master Planning, Curriculum Development, Program Implementation, Theoretical Reserch, Vocational Education, Energy Education, International

526. Akpan, A.E. (1981). A preliminary study of household energy adjustment of Nigerian urban dwellers. (Doctoral dissertation, Ohio State University, 1981). Dissertation Abstracts International, 42(5), 1839-B. UMI No. DEN81-21759.

Descriptors: Social Research, Hypothesis Generation, Descriptive Research, Educational Background, Economic Background, Attitudes, Behaviors, Issue-Based, Energy Education, International

527. Albrecht, D. E. (1982). The New Ecological Paradigm: An exploration into the nature and correlates of Iowans' environmental orientations. (Doctoral dissertation, Iowa State University, 1982). Dissertation Abstracts International, 43(4), 1297-A. UMI No. DEO82-21167.

Descriptors: Social Research, Hypothesis Generation, Descriptive Research, Economic Background, Residence, Attitudes, Values, Issue-Based

528. Alikhani, S. (1987). The relationship between male and female sixth-graders' attitudes and a multidisciplinary outdoor environmental education experience. (Doctoral dissertation, Oklahoma State University, 1986). Dissertation Abstracts International, 47(9), 3291-A. UMI No. DET87-01014.

Descriptors: Outdoor Classroom, Elementary, Middle/Junior High, Program Evaluation, Pre-Experimental Research, Multi-Disciplinary, Gender, Attitudes, Outdoor Education

529. Al-Madhagi, A.A. (1988). Development of a K-12 environmental education program and an evaluation instrument to measure environmental education knowledge and attitudes of Yemen Arab Republic high school students. (Doctoral dissertation, Kansas State University, 1987). Dissertation Abstracts International, 49(3), 415-A. UMI No. DEV88-06231.

Descriptors: K-12, Secondary, Program Development, Instrument Development, Program Evaluation, Theoretical Research, Text-Based, Knowledge, Attitudes, Issue-Based, International

530. Armstrong, J.B. (1990). An evaluation management model for environmental education programs. (Doctoral dissertation, Virginia Polytechnic Institute and State University, 1989). Dissertation Abstracts International, 51(2), 486-A. UMI No. DEX90-17014.

Descriptors: Elementary, Middle/Junior High, Model Building, Program Evaluation, Naturalistic Research, Experimental Research, Interdisciplinary, Text-Based, Knowledge, Attitudes

531. Auyong, J.S. (1984). Relating park visitor experience to level and degree of environmental concern within a social-psychological framework. (Doctoral dissertation, Texas A&M University, 1983). Dissertation Abstracts International, 44(9), 2935-B. UMI No. DEQ83-29896.

Descriptors: Parks/Natural Areas, Psychomotor, Social Research, Hypothesis Generation, Descriptive Research, Attitudes, Concern

532. Backes, D.J. (1988). The communication-mediated role of perceptual, political, and environmental boundaries on management of the Quetico-Superior wilderness of Ontario and Minnesota, 1920-1965. (Doctoral dissertation, University of Wisconsin - Madison, 1988). Dissertation Abstracts International, 49(9), 2436-A. UMI No. DEW88-20032.

Descriptors: Wilderness, Federal Agencies/Programs, Social Research, Historical Research, Visual Perceptions/Preferences, Perceptions/Beliefs, Values, Communications

533. Baird, B.N. (1984). Estimation and tolerance of an environmental health risk: The infuence of risk characteristics, informal judgements, environmental attitudes, and factual knowledge. (Doctoral dissertation, University of Wyoming, 1984). Dissertation Abstracts International, 45(8), 2731-B. UMI No. DER84-25928.

Descriptors: Environmental Sensitivity, Social Research, Descriptive Research, Economic Background, Residence, Age, Knowledge, Attitudes, Issue-Based, Health Education

534. Bar-Lavie, B.Z. (1987). Enhancing meaningful learning in an environmental education program: A case study of a class empowered through the use of Novak's and Gowin's principles of learning how to learn, concept mapping, interviewing, and educating. (Doctoral dissertation, Cornell University, 1987). Dissertation Abstracts International, 48(10), 2590-A. UMI No. DEV87-25751.

Descriptors: Outdoor Classroom, Secondary, Program Evaluation, Naturalistic Research, Experimental Research, Field Trip, Concepts, Knowledge

535. Barr, J.E. (1981). Development of a needs-based curriculum plan in environmental education. (Doctoral dissertation, Louisiana State University, 1980). Dissertation Abstracts International, 41(11), 4590-A. UMI No. DEN81-10399.

Descriptors: Ecology Education, Issue Awareness/Knowledge of Issues, Secondary, Affective, Master Planning, Needs Assessment, Curriculum Development, Descriptive Research, Multi-Disciplinary, Knowledge

536. Barry, C.L. (1984). A cross-cultural study of attitudes and values towards nuclear energy as a major energy source. (Doctoral dissertation, United States International University, 1984). Dissertation Abstracts International, 45(5), 1274-A. UMI No. DEQ84-17797.

Descriptors: Higher Education, Hypothesis Generation, Descriptive Research, Ethnic Background, Residence, Attitudes, Values, Energy Education

537. Bennett, L.B. (1990). A content analysis of environmental themes in selected first, second, and third-grade science textbooks. (Doctoral dissertation, University of Northern Colorado, 1989). Dissertation Abstracts International, 50(12), 3846-A. UMI No. DEX90-07398.

Descriptors: Issue Awareness/Knowledge of Issues, Elementary, Document Analysis, Descriptive Research, Text-Based, Science Education

538. Bentley, M.L. (1985). The role of backcountry experience in middle school environmental education. (Doctoral dissertation, University of Virginia, 1985). Dissertation Abstracts International, 46(10), 2900-A. UMI No. DES85-26888.

Descriptors: Parks/Natural Areas, Elementary, Middle/Junior High, Psychomotor, Naturalistic Research, Social Background, Field Trip, Knowledge, Attitudes, Outdoor Education

539. Berger, J. (1990). Wildlife extension - A participatory approach to conservation: A case study among the Masai people of Kenya. (Doctoral dissertation, University of California - Berkeley, 1989). Dissertation Abstracts International, 51(5), 1474-A. UMI No. DEX90-28739.

Descriptors: Issue Identification and Analysis Skills, Issue Investigation and Evaluation Skills, Adult/Continuing Education, Naturalistic Research, Conservation Education, Resource Management Education, International

540. Biddle, B.A. (1988). The status of environmental education in Texas public schools. (Doctoral dissertation, Texas A&M University, 1988). Dissertation Abstracts International, 49(6), 1420-A. UMI No. DEV88-15844.

Descriptors: K-12, State Agencies/Programs, Teacher Education Inservice, Status Study, Program Development, Program Implementation, Descriptive Research, Multi-Disciplinary, Formal

541. Birney, B.A. (1986). A comparative study of children's perceptions and knowledge of wildlife and conservation as they relate to field trip experiences at the Los Angeles County Museum of Natural History and the Los Angeles Zoo. (Doctoral dissertation, University of California, Los Angeles, 1986). Dissertation Abstracts International, 47(6), 2103-A. UMI No. DES86-21020.

Descriptors: Museums, Elementary, Middle/Junior High, Naturalistic Research, Experimental Research, Field Trip, Concepts, Knowledge, Perceptions/Beliefs, Science Education, Interpretation

542. Bitner, B.L. (1984). Impact study of energy education workshops on the participants and their peer teachers. (Doctoral dissertation, University of Maine, 1983). Dissertation Abstracts International, 44(9), 2725-A. UMI No. DEQ84-00999.

Descriptors: National Agencies/Programs, Teacher Education Inservice, Curriculum Development, Program Evaluation, Pre-Experimental Research, Multi-Disciplinary, Formal, Energy Education

543. Bokhorji-Ghawanni, A.F. (1986). Utilization of field trips in teaching science in the boys' intermediate schools in Saudi Arabia: A study of educational policy implementation. (Doctoral dissertation, Michigan State University, 1985). Dissertation Abstracts International, 46 (12), 3671-A. UMI No. DES86-03380.

Descriptors: Outdoor Classrooms, Middle/Junior High, Teacher Education Inservice, National/Programs/Agencies, Status Study, Descriptive Research, Field Trips, Perceptions/Beliefs, Science Education, Social Studies Education, International

544. Bond, E.A. (1986). Predictors of attitude toward the marine environment among science teachers in Mississippi and Alabama. (Doctoral dissertation, University of Southern Mississippi, 1985). Dissertation Abstracts International, 46(11), 3310-A. UMI No. DES86-00700.

Descriptors: Environmental Sensitivity, Teacher Education Inservice, Prediction Research, Educational Background, Ethnic Background, Residence, Knowledge, Attitudes, Science Education, Marine Education

545. Bousquet, W.S. (1982). An application of Ausubel's learning theory to environmental education: A study of concept mapping in a college natural resources management course. (Doctoral dissertation, Ohio State University, 1982). Dissertation Abstracts International, 43(5), 1515-A. UMI No. DEO82-22053.

Descriptors: Issue Awareness/Knowledge of Issues, Higher Education, Program Evaluation, Experimental Research, Concepts, Knowledge, Cognitive Strategies, Attitudes, Resource Management Education

546. Boyer, E.M. (1981). Independent evaluation of the Wyoming Energy Extension Service. (Doctoral dissertation, University of Wyoming, 1979). Dissertation Abstracts International, 41(10), 4250-A. UMI No. DEN81-06959.

Descriptors: Citizenship Action, Adult/Continuing Education, National Agencies/Programs, Program Evaluation, Pre-Experimental Research, Behaviors, Energy Education

547. Branch, C. (1983). A developmental study in earth and environmental science education with junior high school students: The study of a local stream and science related community problems. (Doctoral dissertation, Columbia University Teachers College, 1983). Dissertation Abstracts International, 44(5), 1407-A. UMI No. DEP83-22179.

Descriptors: Issue Awareness/Knowledge of Issues, Middle/Junior High, Program Evaluation, Experimental Research, Inquiry/Investigation, Laboratory-Based, Perceptions/Beliefs, Knowledge, Science Education

548. Brody, M.J. (1985). Concept mapping, vee diagrams and individual interviews applied to the design of marine trades adult extension curricula and organizational feedback systems. (Doctoral dissertation, Cornell University, 1985). Dissertation Abstracts International, 46(4), 939-A. UMI No. DER85-04440.

Descriptors: Adult/Continuing Education, National Agencies/Programs, Curriculum Development, Program Development, Naturalistic Research, Concepts, Knowledge, Issue-Based, Resource Management Education, Marine Education

549. Bronner, D.M. (1986). A comparison of owners' and renters' winter thermostat setting behavior using a two stage path analysis. (Doctoral dissertation, Kansas State University, 1986). Dissertation Abstracts International, 47(2), 595-B. UMI No. DES86-08671.

Descriptors: Social Research, Prediction Research, Educational Background, Economic Background, Residence, Perceptions/Beliefs, Behaviors, Energy Education

550. Brower, B.L. (1981). Community social issue processes with emphasis on environmental issue relationship to environmental problems. (Doctoral dissertation, Cornell University, 1981). Dissertation Abstracts International, 42(10), 4616-A. UMI No. DEO81-29640.

Descriptors: Issue Identification and Analysis Skills, Social Research, Descriptive Research, Document Analysis, Community Attributes, Behaviors, Communications

551. Brown, M.A. (1988). A status study of environmental education in upper elementary grades of the public schools of Pennsylvania. (Doctoral dissertation, The Pennsylvania State University, 1988). Dissertation Abstracts International, 49(7), 1752-A. UMI No. DEW88-17962.

Descriptors: Ecology Education, State Agencies/Programs, Elementary, Teacher Education Inservice, Status Study, Curriculum Development, Descriptive Research, Perceptions/Beliefs

552. Butler, J.R. (1981). The role of interpretation as a motivating agent toward park resource management. (Doctoral dissertation, University of Washington, 1980). Dissertation Abstracts International, 41(11), 3950-B.

Descriptors: Parks/Natural Areas, Program Evaluation, Experimental Research, Educational Background, Economic Background, Residence, Sources of Information, Attitudes, Behaviors, Resource Management Education, Interpretation

553. Byram, E.E. (1986). The effects of interpersonal communication and change in resource level on behavior in a simulated commons dilemma. (Doctoral dissertation, University of Cincinnati, 1986). Dissertation Abstracts International, 47(10), 4340-B. UMI No. DET86-27593.

Descriptors: Higher Education, Psychomotor, Program Evaluation, Experimental Research, Games, Simulations, Issue-Based, Communications

554. Calkins, J.R. (1986). The production and evaluation of a marine education video program: Comparing Piagettian developmental levels to video learning with junior high school, high school, and college groups. (Doctoral dissertation, University of Maine, 1985). Dissertation Abstracts International, 47(2), 488-A. UMI No. DES86-06945.

Descriptors: Middle/Junior High, Secondary, Higher Education, Program Evaluation, Pre-Experimental Research, Media-Based, Concepts, Knowledge, Marine Education

555. Cameron, D.F. (1990). Communication and energy perspectives: A study of energy communicators. (Doctoral dissertation, University of Kentucky, 1989). Dissertation Abstracts International, 50(9), 2688-A. UMI No. DEX90-04870.

Descriptors: Social Research, Descriptive Research, Perceptions/ Beliefs, Energy Education, Communications

556. Campbell, C.R. (1990). Environmental health and safety at Arizona State University at Tempe: Development of a model program. (Doctoral dissertation, Nova University, 1990). Dissertation Abstracts International, 51(5), 1516-A. UMI No. DEX90-26879.

Descriptors: Higher Education, Model Building, Program Development, Program Evaluation, Descriptive Research, Health Education

557. Carrie, J. (1987). The growth of the concept energy - A longitudinal study in Scottish secondary schools. (Doctoral dissertation, University of Glasgow, United Kingdom, 1984). Dissertation Abstracts International, 49(3), 473-A. British Library Order No. BRDX-80991.

Descriptors: Secondary, Descriptive Research, Concepts, Knowledge, Science Education, Energy Education, International

558. Cartwright, D.D. (1981). Energy Environment Simulator vs. lecture: Methods of developing energy awareness and attitudes in individuals of various cognitive levels. (Doctoral dissertation, University of Idaho, 1981). Dissertation Abstracts International, 42(3), 1084-A. UMI No. DEN81-19875.

Descriptors: Program Evaluation, Experimental Research, Lecture, Simulations, Concepts, Knowledge, Attitudes, Energy Education

559. Champeau, R. (1983). Development and testing of a preceived environmental control measure. (Doctoral dissertation, Michigan State University, 1982). Dissertation Abstracts International, 43(9), 2974-A. UMI No. DEP83-03761. (check 45(10))

Descriptors: Citizenship Action, Higher Education, Teacher Education Inservice, Instrument Development, Theoretical Research, Economic Background, Age, Gender, Locus of Control/Efficacy, Behaviors, Issue-Based

560. Chatelain, L. (1981). Residential energy conservation practices, weatherization features in dwellings and electrical energy consumption in rural and urban households in Utah. (Doctoral dissertation, Florida State University, 1981). Dissertation Abstracts International, 42(1), 159-B. UMI No. DEN81-13258.

Descriptors: Social Research, Hypothesis Generation, Descriptive Research, Educational Background, Economic Background, Residence, Age, Gender, Behaviors, Energy Education

561. Cherif, A.H. (1990). Ecology and education: Alternative prospective framework for ecology education. (Doctoral dissertation, Simon Fraser University, 1989). Dissertation Abstracts International, 50(7), 1913-A.

Descriptors: Ecology Education, Secondary, Teacher Education Inservice, Status Study, Curriculum Development, Naturalistic Research, Interdisciplinary, Science Education

562. Childers, D. (1981). The effects of environmental case studies instruction on ninth grade student's environmental values, transfer of those values, and perception of willingness to take citizenship action. (Doctoral dissertation, So. Illinois University at Carbondale, 1980). Dissertation Abstracts International, 42(4), 1574-A. UMI No. DEN81-20675.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Program Evaluation, Experimental Research, Simulations, Role Playing, Case Studies, Perceptions/Beliefs, Values, Verbal Commitment/Intention, Science Education

563. Christy, W.R. (1983). As assessment of the effects of two residential camp settings on environmental attitude development. (Doctoral dissertation, Virginia Polytechnic Institute and State University, 1982). Dissertation Abstracts International, 44(1), 282-A. UMI No. DEP83-12304.

Descriptors: Camps/Residential Centers, Program Evaluation, Experimental Research, Non-Formal, Group Membership, Attitudes, Outdoor Education

564. Coffey, D.D. (1983). Environmental education in the life science curriculum in secondary schools in the state of Oregon. (Doctoral dissertation, University of Oregon, 1982). Dissertation Abstracts International, 43(9), 2872-A. UMI No. DEP83-01766.

Descriptors: Environmental Sensitivity, Issue Awareness/Knowledge of Issues Secondary, Teacher Education Inservice, State Agencies/Program, Status Study, Descriptive Research, Multi-Disciplinary, Text-Based, Science Education

565. Coffey, J.M. (1982). A study of energy education on the elementary level in Colorado: An evaluation of Energy and Man's Environment. (Doctoral dissertation, University of Colorado at Boulder, 1981). Dissertation Abstracts International, 42(8), 3409-A. UMI No. DE082-01503.

Descriptors: Elementary, Teacher Education Inservice, Program Implementation, Program Evaluation, Experimental Research, Knowledge, Attitudes, Behaviors, Science Education, Energy Education

566. Collins, N.E. (1983). Planning, implementing and evaluating energy hot-lines: Profiles and guidance. (Doctoral dissertation, University of Tennessee, 1981). Dissertation Abstracts International, 44(4), 901-A. UMI No. DEP83-19330.

Descriptors: Higher Education, State Agencies/Program, National Agencies/Programs, Status Study, Program Implementation, Program Evaluation, Descriptive Research, Energy Education, Communications

567. Compos-Arredondo, O. (1985). An assessment of science-related environmental issues among Venezuelan students with comparisons to United States student data (NAEP). (Doctoral dissertation, University of Colorado at Boulder, 1985). Dissertation Abstracts International, 46(8), 2253-A. UMI No. DES85-22650.

Descriptors: Issue Awareness/Knowledge of Issues, Status Study, Ex Post Facto Research, Secondary Analysis, Perceptions/Beliefs, Knowledge, Attitudes, Science Education, International

568. Conover, M.E. (1985). Differences and relationships between selected characteristics of participants and non-participants in an interest free retrofitting loan program. (Doctoral dissertation, Ohio State University, 1985). Dissertation Abstracts International, 46(9), 2593-A. UMI No. DES85-26161.

Descriptors: Social Research, Program Evaluation, Ex Post Facto Research, Educational Background, Economic Background, Age, Gender, Attitudes, Behaviors, Energy Education

569. Corcoran, P. (1986). A formative evaluation of science and natural history curriculum materials and their influence on Maine science teaching, K-Twelve. (Doctoral dissertation, University of Maine, 1985). Dissertation Abstracts International, 47(8), 2980-A. UMI No. DET86-14142.

Descriptors: K-12, Teacher Education Inservice, State Agencies/ Programs, Program Implementation, Program Evaluation, Pre-Experimental Research, Environmental Sensitivity, Attitudes, Nature Study, Science Education

570. Cornwell, M.L. (1989). Male/female differences in environmental concern. (Doctoral dissertation, State University of New York at Buffalo, 1989). Dissertation Abstracts International, 50(4), 1096-A. UMI No. DEW89-13504.

Descriptors: Social Research, Hypothesis Generation, Descriptive Research, Group Membership, Gender, Concern, Issue-Based, International

571. Corsino-Frost, L.A. (1981). The role of students in environmental pollution research. (Doctoral dissertation, University of Virginia, 1981). Dissertation Abstracts International, 42(3), 1084-A. UMI No. DEN81-17921.
Descriptors: Issue Investigation and Evaluation Skills, K-12, Higher Education, Teacher Education Inservice, Descriptive Research, Educational Background, Gender, Perceptions/Beliefs, International

572. Cortes, L.P. (1987). A survey of the environmental knowledge, comprehension, responsibility, and interest of the secondary level students and teachers in the Phillipines. (Doctoral dissertation, Michigan State University, 1986). Dissertation Abstracts International, 47(7), 2529-A. UMI No. DET87-13278.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Teacher Education Inservice, Status Study, Curriculum Development, Descriptive Research, Educational Background, Residence, Knowledge, Values, Personal Responsibility, International

573. Costantino, A.A. (1981). Religiosity, man's relationship to nature and environmental concern. (Doctoral dissertation, The Pennsylvania State University, 1981). Dissertation Abstracts International, 42(1), 392-A. UMI No. DEN81-12792.

Descriptors: Social Research, Hypothesis Generation, Descriptive Research, Perceptions/Beliefs, Concern, Religious Education

574. Cothron, J.H. (1984). The formation of ecological concepts and conceptual systems by upper elementary students. (Doctoral dissertation, University of Virginia, 1983). Dissertation Abstracts International, 44(12), 3651-A. UMI No. DEQ84-06037.

Descriptors: Ecology Education, Elementary, Program Evaluation, Curriculum Development, Pre-Experimental Research, Educational Background, Text-Based, Aptitude, Concepts, Knowledge

575. Covert, D. (1983). Attitudes, actions, and communication behaviors of teachers before and after experiencing an environmental education workshop. (Doctoral dissertation, Michigan State University, 1982). Dissertation Abstracts International, 43(9), 2968-A. UMI No. DEP83-03765.

Descriptors: Teacher Education Inservice, Program Evaluation, Pre-Experimental Research, Sources of Information, Attitudes, Behaviors, Outdoor Education, Communications

576. Cox, D. (1981). Early adolescents use of education problem solving skills in microcomputers. (Doctoral dissertation, University of Michigan, 1980).
Dissertation Abstracts International, 41(9), 3855-A. UMI No. DEN81-06123.

Descriptors: Issue Investigation and Evaluation, Citizenship Action, Middle/Junior High, Experimental Research, Computerized Instruction, Cognitive Strategies, Science Education, Social Studies Education

577. Coyle, N.J. (1982). Education for energy conservation and alternative energy in the State of Nevada. (Doctoral dissertation, University of Nevada, Reno, 1981). Dissertation Abstracts International, 42(8), 3574-A. UMI No. DEO82-02895.

Descriptors: Citizenship Action, Secondary, Adult/Continuing Education, Status Study, Needs Assessment, Descriptive Research, Educational Background, Age, Perceptions/Beliefs, Vocational Education, Energy Education

578. Curran, R. (1981). Development and testing of an educational slide presentation on natural family planning. (Doctoral dissertation, Columbia University Teachers College, 1981). Dissertation Abstracts International, 41(12), 4986-A. UMI No. DEN81-11507.

Descriptors: Curriculum Development, Program Evaluation, Instrument Development, Experimental Research, Lecture, Media-Based, Knowledge, Health Education

579. Dagwell, C.V. (1984). Energy-efficient, innovative housing: A comparison of probable adopters and non-adopters. (Doctoral dissertation, Virginia Polytechnic Institute and State University, 1983). Dissertation Abstracts International, 45(2), 527-B. UMI No. DEQ84-09685.

Descriptors: Citizenship Action, Social Research, Ex Post Facto Research, Secondary Analysis, Educational Background, Age, Perceptions/Beliefs, Behaviors, Energy Education

580. David, J.R. (1984). An evaluation of "Project Learning Tree" in Arizona. An interdisciplinary approach to environmental awareness. (Doctoral dissertation, Northern Arizona University, 1984). Dissertation Abstracts International, 45(2), 396-A. UMI No. DEQ84-11454.

Descriptors: Teacher Education Inservice, State Agencies/Programs, Program Evaluation, Experimental Research, Multi-Disciplinary, Text-Based, Knowledge, Attitudes

581. Dellinger, S.A. (1987). The effects of a nonformal energy education program on behavioral change in selected North Carolina residents. (Doctoral dissertation, North Carolina State University, 1987). Dissertation Abstracts International, 48(3), 538-A. UMI No. DET87-12538.

Descriptors: Citizenship Action, Adult/Continuing Education, Program Evaluation, Experimental Research, Non-Formal, Educational Background, Age, Knowledge, Attitudes, Behaviors, Energy Education

582. Democker, S.C. (1987). A trail of desire: Aspects of relationship with nature. (Doctoral dissertation, University of Rochester, 1987). Dissertation Abstracts International, 47(12), 4351-A. UMI No. DET87-05921.

Descriptors: Wilderness, Curriculum Development, Theoretical Research, Outdoor Education

583. Do Brito Da Fonseca, J.M. (1985). Educators' attitudes toward environmental education in Portugal: Development and evaluation of an inservice workshop. (Doctoral dissertation, University of Iowa, 1985). Dissertation Abstracts International, 46(6), 1582-A. UMI No. DER85-18821.

Descriptors: Elementary, Teacher Education Inservice, Program Evaluation, Curriculum Development, Pre-Experimental Research, Educational Background, Knowledge, Attitudes, Science Education, International

584. Donnellan, L.M. (1986). The making of a field naturalist: Case study of professional socialization. (Doctoral dissertation, Rensselaer Polytechnic Institute, 1986). Dissertation Abstracts International, 47(6), 2322-A. UMI No. DES86-19972.

Descriptors: Higher Education, Program Development, Program Implementation, Naturalistic Research, Individualized Instruction, Gender, Nature Study, Science Education

585. Doran, R.J. (1982). A study of selected ACUHO related colleges and universities' energy conservation practices with recommendations for implementing a residence hall energy conservation program. (Doctoral dissertation, University of Tennessee, 1981). Dissertation Abstracts International, 42(9), 3823-A. UMI No. DEO82-03829.

Descriptors: Citizenship Action, Higher Education, Program Development, Program Evaluation, Descriptive Research, Behavioral Methods, Perceptions/Beliefs, Behaviors, Energy Education

586. Dow, D.J. (1982). The development of a commercial fisheries curriculum for the Maine Trades Center at Eastport: A process description and analysis. (Doctoral dissertation, University of Maine, 1981). American Doctoral Dissertations 1980-81, p. 128.

Descriptors: Adult/Continuing Education, Curriculum Development, Program Evaluation, Vocational Education, Marine Education

587. Dresner, M. (1985). Promoting environmental activism through participation in a renewable energy planning simulation game. (Doctoral dissertation, University of Michigan, 1985). Dissertation Abstracts International, 46(4), 1379-B. DER85-12394.

Descriptors: Citizenship Action, Higher Education, Program Evaluation, Experimental Research, Social Learning Methods, Games, Simulations, Attitudes, Locus of Control/Efficacy, Behaviors, Energy Education

588. Drysdale, R.B. (198__). An interpretation of winter ecology experiences at the high school level. (Doctoral dissertation, University of Alberta, 1984). Canadian Theses, National Library of Canada, Ottawa, Ontario.

Descriptors: Ecology Education, Secondary, Program Evaluation

589. Dzubiek, D.R. (1985). Teachers' opinions of environmental education in Pennsylvania. (Doctoral dissertation, University of Pittsburgh, 1984). Dissertation Abstracts International, 45(11), 3278-A. UMI No. DER85-00299.

Descriptors: Elementary, Teacher Education Preservice, State Agencies/Programs, Status Study, Needs Assessment, Descriptive Research, Multi-Disciplinary, Educational Background, Perceptions/Beliefs, Science Education

590. Edmondson, M.E. (1982). Energy guide label information and consumer durable expenditures. (Doctoral dissertation, University of Tennessee, 1982). Dissertation Abstracts International, 43(6), 1858-A. UMI No. DE082-25333.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Curriculum Development, Program Evaluation, Experimental Research, Perceptions/Beliefs, Knowledge, Attitudes, Verbal Commitment/Intention, Energy Education

591. Edralin, N.E. (1990). Attitudes and teaching perceptions related to environmental concerns of prospective middle/high school teachers in colleges and universities in East Tennessee. (Doctoral dissertation, University of Tennessee, 1989). Dissertation Abstracts International, 50(11), 3460-A. UMI No. DEX90-09072.

Descriptors: Issue Awareness/Knowledge of Issues, Middle/Junior High, Secondary, Teacher Education Preservice, Status Study, Program Development, Descriptive Research, Knowledge, Perceptions/Beliefs, Attitudes, Concern

592. Edwards, F. (1985). Teaching argumentation in a natural resource context: Improving critical thinking. (Doctoral dissertation, University of Michigan, 1985). Dissertation Abstracts International, 46(7), 2249-B. UMI No. DES85-20889.

Descriptors: Issue Investigation and Evaluation Skills, Higher Education, Program Evaluation, Experimental Research, Directed Instruction, Knowledge, Cognitive Strategies, Values, Resource Management Education

593. Elebiary, S.H. (1983). Population education instruction objectives for Egyptian secondary schools. (Doctoral dissertation, Boston University School of Education, 1983). Dissertation Abstracts International, 44(5), 1342-A. UMI No. DEP83-19887.

Descriptors: Issue Awareness/Knowledge of Issues, Issue Indentification and Analysis Skills, Values Clarification Skills, Secondary, Cognitive, Affective, Curriculum Development, Delphi Study, Population Education, International

594. Eleuterius, C.K. (1988). The learning styles of marine scientists. (Doctoral dissertation, University of Southern Mississippi, 1987). Dissertation Abstracts International, 49(4), 698-A. UMI No. DEV88-06652.

Descriptors: Adult/Continuing Education, Hypothesis Generation, Descriptive Research, Educational Background, Age, Cognitive Style, Preferences, Marine Education

595. Emshousen, F.W. (1983). Energy literacy of Indiana high school practical arts and vocational teachers. (Doctoral dissertation, University of Illinois at Urbana-Champaign, 1983). Dissertation Abstracts International, 44(6), 1770-A. DEP83-24543.

Descriptors: Issue Awareness/Knowledge of Issues, Teacher Education Inservice, Instrument Development, Status Study, Descriptive Research, Educational Background, Age, Gender, Knowledge, Vocational Education, Energy Education

596. Euler, A. (1988). A comparative study of the effectiveness of a formal vs non-formal environmental education program for male and female sixth grade students' environmental knowledge and attitudes. (Doctoral dissertation, St. John's University, 1988). Dissertation Abstracts International, 49(7), 1682-A. UMI No. DEW88-19790.

Descriptors: Environmental/Nature Centers, Elementary, Middle/Junior High, Program Evaluation, Experimental Research, Formal, Non-Formal, Urban, Gender, Knowledge, Attitudes, Issue-Based

597. Fairfied-Sonn, J.W. (1986). Group ideology and intergroup behavior: A comparative study of several environmental groups. (Doctoral dissertation, Yale University, 1985). Dissertation Abstracts International, 47(4), 1786-B. UMI No. DES86-12955.

Descriptors: Social Research, Model Building, Descriptive Research, Naturalistic Research, Group Membership

598. Faryniarz, J.V. (1990). The effectiveness of microcomputer simulators to stimulate environmental problem-solving with community college students. (Doctoral dissertation, University of Massachusetts, 1989). Dissertation Abstracts International, 50(8), 2362-A. UMI No. DEX90-02473.

Descriptors: Issue Identification and Analysis Skills, Issue Investigation and Evaluation Skills, Higher Education, Program Evaluation, Experimental Research, Computerized Instruction, Simulations, Cognitive Strategies

599. Finlay, T.W. (1990). The prediction of preference evaluations of zoo exhibits: A comparison of the informational and psychological theories of environmental preference. (Doctoral dissertation, Georgia Institute of Technology, 1989). Dissertation Abstracts International, 51(1), 427-B. UMI No. DEX90-14861.

Descriptors: Museums, Program Development, Program Evaluation, Prediction Research, Non-Formal, Visual Perceptions/Preferences

600. Fishman, P.B. (1984). Teaching children about food purchasing and ecology: An exploratory study. (Doctoral dissertation, Columbia University Teachers College, 1984). Dissertation Abstracts International, 45(8), 2403-A. UMI No. DER84-24219.

Descriptors: Issue Awareness/Knowledge of Issues, Citizenship Action, Elementary, Program Development, Program Evaluation, Pre-Experimental Research, Social Learning Methods, Ethnic Background, Urban, Behaviors, Health Education

601. Foley, R.L. (1986). Renewable energy education and industrial arts: Linking knowledge producers with knowledge users. (Doctoral dissertation, University of Massachusetts, 1985). Dissertation Abstracts International, 46(12), 3631-A. UMI No. DES86-02632.

Descriptors: Teacher Education Inservice, State Agencies/Programs, Needs Assessment, Program Development, Descriptive Research, Prediction Research, Vocational Education, Energy Education

602. Fontenot, D. (1982). A curriculum for training extension professionals in energy conservation education. (Doctoral dissertation, Louisiana State University and Agricultural and Mechanical College, 1982). Dissertation Abstracts International, 43(3), 645-A. UMI No. DEO82-16835.

Descriptors: Teacher Education Inservice, National Agencies/Programs, Needs Assessment, Curriculum Development, Descriptive Research, Educational Background, Residence, Age, Gender, Concepts, Knowledge Energy Education

603. Fouda, S.Z. (1981). Effectiveness of two instructional designs based on Gagne's learning hierarchy and Ausubel's subsumption theory and two modes of presentation in teaching the concept of "Mutualism in nature" to tenth grade girls in the Egyptian high schools. (Doctoral dissertation, Temple University, 1980). Dissertation Abstracts International, 41(8), 3488-A. UMI No. DEN81-01860.

Descriptors: Ecology Education, Secondary, Teacher Education Inservice, Program Evaluation, Experimental Research, Directed Instruction, Media-Based, Gender, Concepts, Knowledge, Science Education, International

604. Fraser, S. (1983). The relationship of socio-cultural factors to environmental attitudes. (Doctoral dissertation, University of Missouri at Kansas City, 1983). Dissertation Abstracts International, 44(3), 720-A. UMI No. DEP83-15197.

Descriptors: Environmental Sensitivity, Hypothesis Generation, Descriptive Research, Educational Background, Residence, Knowledge, Attitudes

605. French, B.T. (1982). Importance and location of instruction for sixty-eight energy competencies for Kansas agriculture. (Doctoral dissertation, Kansas State University, 1982). Dissertation Abstracts International, 43(4), 1015-A. UMI No. DEO82-21837.

Descriptors: Secondary, Higher Education, Teacher Education Inservice, Curriculum Development, Descriptive Research, Age, Perceptions/ Beliefs, Preferences, Vocational Education, Energy Education

606. Gan, S.L. (1988). Environmental education in Maylasia: Curriculum guidelines for pre-service science teacher education programs. (Doctoral dissertation, University of Hawaii, 1987). Dissertation Abstracts International, 49(2), 194-A. (UMI No. Not Available).

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Teacher Education Preservice, Status Study, Needs Assessment, Curriculum Development, Descriptive Research, Document Analysis, Interdisciplinary, Multi-Disciplinary, Science Education, International

607. Gordon, S.P. (1982). An investigation of psychological components of water conservation behavior. (Doctoral dissertation, North Carolina State University at Raleigh, 1981). Dissertation Abstracts International, 42(11), 4618-B. UMI No. DEO82-09465.

Descriptors: Citizenship Action, Social Research, Model Building, Program Development, Prediction Research, Knowledge, Personal Responsibility, Behaviors, Energy Education

608. Grauer, S.R. (1989). Think globally, act locally: A Delphi study of educational leadership through the development of international resources in the local community. (Doctoral dissertation, University of San Diego, 1989). Dissertation Abstracts International, 50(4), 888-A. UMI No. DEW89-12759.

Descriptors: Community Resources, K-12, Model Building, Program Development, Delphi Study, Global Education

609. Greene, L.D. (1986). Prediction of aesthetic response: A comparison of different philosophical paradigms' predictive utilities of aesthetic response toward natural landscape scenes. (Doctoral dissertation, Virginia Polytechnic Institute and State University, 1986). Dissertation Abstracts International, 47(6), 2086-A. UMI No. DES86-20620.

Descriptors: Parks/Natural Areas, Cognitive, Psychomotor, Social Research, Prediction Research, Environmental Sensitivity, Visual Perceptions/Preferences, Resource Management Education

610. Griffin, E.A. (1982). A study of outdoor education programs provided for gifted elementary and secondary school students by selected outdoor education centers and by Boards of Cooperative Educational Services in New York State. (Doctoral dissertation, University of Minnesota, 1982). Dissertation Abstracts International, 43(1), 264-A. UMI No. DEP82-13950.

Descriptors: Environmnetal/Nature Centers, Community Resources, K-12, State Agencies/Programs, Status Study, Descriptive Research, Interdisciplinary, Gifted/Talented, Outdoor Education, Science Education

611. Griffin, S. (1982). The effects of an adolescent apprenticeship process in environmental education on the develpoment of citizen participation characteristics in high school seniors. (Doctoral dissertation, University of Massachusetts, 1982). Dissertation Abstracts International, 43(8), 2623-A. UMI No. DEP82-29556.

Descriptors: Citizenship Action, Secondary, Program Evaluation, Experimental Research, Action Learning, Attitudes, Moral Development, Locus of Control/Efficacy

612. Grimes, D.B. (1981). Energy and Man's Environment: An evaluation of its core instructional materials. (Doctoral dissertation, Brigham Young University, 1981). Dissertation Abstracts International, 42(5), 1930-A. UMI No. DEN81-24779.

Descriptors: K-12, Teacher Education Inservice, Needs Assessment, Program Evaluation, Ex Post Facto Research, Text-Based, Perceptions/Beliefs, Energy Education

613. Grossman, G.M. (1986). Stratum and social base correlates of differential attitudes toward community environmental issues: Competing structural models and leader/non-leader comparisons. (Doctoral dissertation, Purdue University, 1985). Dissertation Abstracts International, 47(3), 1064-A. UMI No. DES86-06546.

Descriptors: Social Research, Model Building, Descriptive Research, Community Attributes, Educational Background, Social Background, Economic Background, Age, Concern, Issue-Based

614. Hagul, P. (1982). Teachers and implementation of population education: A case study of the Yogyakarta Special Region Indonesia. (Doctoral dissertation, Florida State University, 1981). Dissertation Abstracts International, 42(10), 4209-A. UMI No. DEO82-05693.

Descriptors: Middle/Junior High, Secondary, Teacher Education Inservice, Program Implementation, Prediction Research, Text-Based, Educational Background, Age, Attitudes, Population Education, International

615. Hall, G.L. (1981). The teaching of ecology in novel and relevant wilderness settings and its effect on the ecological thinking, feeling, and perceiving of elementary school youth. (Doctoral dissertation, University of Montana, 1980). Dissertation Abstracts International, 41(8), 3514-A. UMI No. DEN81-03022.

Descriptors: Ecology Education, Wilderness, Elementary, Cognitive, Affective, Psychomotor, Program Evaluation, Experimental Research, Inquiry/Investigation, Directed Instruction, Environmental Sensitivity, Perceptions

616. Halverson, W.F. (1981). An environmental education curriculum: Its development and dissemination. (Doctoral dissertation, University of Wisconsin - Madison, 1980). Dissertation Abstracts International, 41(12), 5045-A. UMI No. DEN81-06501.

Descriptors: Issue Awareness/Knowledge of Issues, K-12, Teacher Education Inservice, State Agencies/Programs, National Agencies/Programs, Curriculum Development, Program Implementation, Program Evaluation, Pre-Experimental Research, Concepts, Knowledge, Attitudes

617. Hamilton, J. (1983). Some relationships among knowledge, locus of control, perceived importance, and perceived personal responsibility regarding environmental problems. (Doctoral dissertation, The Pennsylvania State University, 1983). Dissertation Abstracts International, 44(6), 1920-A. UMI No. DEP83-20881.

Descriptors: Secondary, Higher Education, Hypothesis Generation, Instrument Development, Descriptive Research, Knowledge, Perceptions/Beliefs, Locus of Control/Efficacy, Personal Responsibility, Issue-Based

618. Ham, S.H. (1982). Familiarity and adaptation: A study of family attendance at interpretive activities. (Doctoral dissertation, University of Idaho, 1982). Dissertation Abstracts International, 43(6), 2097-A. UMI No. DEO82-24565.

Descriptors: Social Research, Psychomotor, Program Evaluation, Experimental Research, Educational Background, Interpretation

619. Hamm, M.F. (1986). The treatment of global issues by sixth and seventh grade science textbooks. (Doctoral dissertation, University of Northern Colorado, 1986). Dissertation Abstracts International, 47(9), 3385-A. UMI No. DET86-29376.

Descriptors: Middle/Junior High, Program Evaluation, Document Analysis, Text-Based, Issue-Based, Science Education, Global Education

620. Hamm, R.W. (1985). A systematic evaluation of an environmental investigations course. (Doctoral dissertation, Georgia State University, 1985). *Dissertation Abstracts International*, *46*(8), 2254-A. UMI No. DES85-21701.

Descriptors: Teacher Education Preservice, Program Development, Program Evaluation, Pre-Experimental Research, Concepts, Knowledge, Attitudes, Science Education

621. Hand, C.M. (1986). Energy attitudes, beliefs and behavior: A specification of situational and personal determinants of residential conservation behavior. (Doctoral dissertation, University of Tennessee, 1986). *Dissertation Abstracts International*, *47*(7), 2745-A. UMI No. DET86-24245.

Descriptors Citizenship Action, Social Research, Model Building, Descriptive Research, Knowledge, Perceptions/Beliefs, Attitudes, Behaviors, Energy Education

622. Hanna, G.M. (1988). The effects of adventure and ecology education programming on participants' knowledge, attitude, intentions, and behavior. (Doctoral dissertation, Ohio State University, 1988). *Dissertation Abstracts International*, *50*(2), 386-A. UMI No. DEW89-07234.

Descriptors: Ecology Education, Wilderness, Social Reserch, Program Evaluation, Experimental Research, Naturalistic Research, Residence, Age, Knowledge, Attitudes, Verbal Commitment/Intention, Behavior, Outdoor Education

623. Hassan, A.A. (1985). The status of environmental education in the Egyptian secondary schools as perceived by science and social science teachers and administrative personnel. (Doctoral dissertation, Michigan State University, 1984). *Dissertation Abstracts International*, *46*(4), 857-A. UMI No. DER85-07499.

Descriptors: Issue Awareness/Knowledge of Issues, Issue Investigation and Evaluation Skills, Citizenshiup Action, Secondary, Teacher Education Inservice, Status Stydy, Descriptive Reserch, Multi-Disciplinary, Attitudes, Science Education, Social Studies Education, International

624. Head, S.C. (1982). A history of conservation in Texas, 1860-1963. (Doctoral dissertation, Texas Tech University, 1982). *Dissertation Abstracts International*, *43*(4), 1063-A. UMI No. DEO82-21974.

Descriptors: State Agencies/Programs, Social Research, Historical Research, Conservation Education, Resource Management Education

625. Hedlund, W.H. (1982). The development of a test instrument for marine knowledge for adults in northern New England. (Doctoral dissertation, University of Maine, 1982). Dissertation Abstracts International, 43 (6), 1914-A. UMI No. DE082-26729.

Descriptors: Teacher Education Inservice, National Agencies/Programs, Instrument Development, Descriptive Research, Educational Background, Economic Background, Residence, Age, Gender, Concepts, Knowledge, Marine Education

626. Herbert, L. (1987). A comparison of interests in science and environmental education and their implications for instruction. (Doctoral dissertation, State University of New York at Buffalo, 1986). Dissertation Abstracts International, 47(10), 3724-A. UMI No. DET87-02184.

Descriptors: Middle/Junior High, Secondary, Hypothesis Generation, Program Development, Descriptive Research, Action Learning, Gender, Attitudes, Science Education, Health Education

627. Hicks, B.V. (1986). Environmental perception studies of Andean peasants for educational and development planning. (Doctoral dissertation, University of Massachusetts, 1986). Dissertation Abstracts International, 47(3), 755-A. UMI No. DES86-12047.

Descriptors: Social Research, Needs Assessment, Program Development, Descriptive Research, Economic Background, Knowledge, Perceptions/Beliefs, International

628. Hinchey, J.O. (1987). Recommendations for residential water conservation: A delphi application. (Doctoral dissertation, Texas Woman's University, 1987). Dissertation Abstracts International, 48(10), 2947-B. UMI No. DEV87-29646.

Descriptors: Citizenship Action, Social Research, Program Development, Delphi Study, Group Membership, Perceptions/Beliefs, Conservation Education

629. Hines, J.M. (1985). An analysis and synthesis of research on responsible environmental behavior. (Doctoral dissertation, Southern Illinois University at Carbondale, 1984). Dissertation Abstracts International, 46(3), 665-A. UMI No. DER85-10027.

Descriptors: Citizenship Action, Model Building, Synthesis of Research, Behavioral Methods, Educational Background, Economic Background, Knowledge, Attitudes, Locus of Control/Efficacy, Personal Responsibility, Verbal Commitment/Intention, Behaviors

630. Hirshorn, A.H. (1986). Urban ecology: The development of a conceptually oriented guidebook for elementary science (Grades 4-6). (Doctoral dissertation, Columbia University Teachers College, 1986). Dissertation Abstracts International, 47(6), 2104-A. UMI No. DES86-20365.

Descriptors: Ecology Education, Community Resources, Elementary, Curriculum Development, Theoretical Research, Inquiry/Investigation, Field Trips, Laboratory-Based, Urban, Concepts, Outdoor Education, Science Education

631. Hollenbeck, B.G. (1986). Reducing residential energy consumption: The effects of government subsidies on energy conservation. (Doctoral dissertation, Florida State University, 1984). Dissertation Abstracts International, 47(1), 376-B. UMI No. DES86-05766.

Descriptors: Citizenship Action, State Agencies/Programs, Social Research, Program Evaluation, Experimental Research, Behaviors, Energy Education

632. Holly, J.T. (1982). A comparative study of outdoor and indoor instruction in ecological studies on student perceptions of classroom climate and achievement at the sixth grade level of a large metropolitan school district. (Doctoral dissertation, University of Southern Mississippi, 1982). Dissertation Abstracts International, 43(6), 1914-A. UMI No. DEO82-26849.

Descriptors: Ecology Education, Elementary, Middle/Junior High, Program Evaluation, Experimental Research, Directed Instruction, Outdoor Education, Urban, Knowledge, Perceptions/Beliefs

633. Horn, B.R. (1982). Planning transnational environmental communications (TEC) networks: A conceptual theoretical framework. (Doctoral dissertation, University of Michigan, 1980). American Doctoral Dissertations, 1980/81, p. 236.

Descriptors: Program Development, Theoretical Research, Communications

634. Hoyle, L.E. (1981). Computer simulation and driver training: Application toward energy conservation. (Doctoral dissertation, University of Kansas, 1980). Dissertation Abstracts International, 41(12), 4742-B. UMI No. DEN81-11737.

Descriptors: Social Research, Psychomotor, Program Evaluation, Experimental Research, Behavioral Methods, Simulations, Behaviors, Energy Education

635. Hudspeth, T.R. (1983). Visual preference as a tool for citizen participation: A case study of urban waterfront revitalization in Burlington, Vermont. (Doctoral dissertation, University of Michigan, 1982). Dissertation Abstracts International, 43(10), 3437-A. UMI No. DEP83-04511.

Descriptors: Citizenship Action, Social Research, Program Development, Descriptive Research, Urban, Group Membership, Visual Perceptions/ Preferences, Resource Management Education

636. Hunter, J.K. (1990). Analysis of educational and industrial priorities concerning economic diversification of Alaska's natural resources. (Doctoral dissertation, East Texas State University, 1990). Dissertation Abstracts International, 51(5), 1531-A. UMI No. DEX90-25271.

Descriptors: State Agencies/Programs, Social Research, Needs Assessment, Curriculum Development, Descriptive Research, Ethnic Background, Economic Background, Age, Gender, Perceptions/Beliefs, Resource Management Education

637. Hurry, L.B. (1984). Directions in environmental education and their implication for the training of primary school teachers in the Transvaal: Towards a synthesis. (Doctoral dissertation, University of South Africa, 1983). Dissertation Abstracts International, 45(5), 1370-A.

Descriptors: Elementary, Teacher Education Preservice, Model Building, Program Evaluation, Program Development, Theoretical Research, International

638. Iacofano, D.S. (1986). Public involvement in environmental planning: A proactive theory for program design and management. (Doctoral dissertation, University of California - Berkeley, 1986). Dissertation Abstracts International, 48(5), 1333-A. UMI No. DET87-18024.

Descriptors: Citizenship Action, Adult/Continuing Education, Social Research, Model Building, Program Development, Theoretical Research, Secondary Analysis, Resource Management Education

639. Irwin, R.D. (1983). A compilation of religious literature pertinent to the study of environmental ethics in higher education. (Doctoral dissertation, Brigham Young University, 1983). Dissertation Abstracts International, 43(9), 2954-A. UMI No. DEP83-03277.

Descriptors: Higher Education, Theoretical Research, Document Analysis, Values/Moral Education, Religious Education, International

640. Jensen, T.D. (1983). The effects of self-comparison and social-comparison feedback on energy consumption. (Doctoral dissertation, University of Arkansas, 1982). Dissertation Abstracts International, 43(10), 3410-B. UMI NO. DEP83-05135.

Descriptors: Social Research, Program Evaluation, Experimental Research, Social Learning Methods, Behavioral Methods, Knowledge, Behaviors, Energy Education

641. Jeppesen, J.C. (1985). Residential energy conservation: Do followup programs make a difference? (Doctoral dissertation, Michigan State University, 1985). Dissertation Abstracts International, 46(7), 2498-B. UMI No. DES85-20532.

Descriptors: Citizenship Action, Social Research Program Evaluation, Experimental Research, Action Learning, Behavioral Methods, Behaviors, Energy Education

642. Jimenez, J.C. (1983). An educational approach to create an awareness and understanding of the marine mammals that inhabit the waters of Puerto Rico. (Doctoral dissertation, University of Massachusetts, 1983). Dissertation Abstracts International, 43(12), 3867-A. UMI No. DEP83-10296.

Descriptors: Ecology Education, Social Research, Program Development, Naturalistic Research, Lecture, Knowledge, Marine Education, Interpretation, Communications, International

643. Joerger, J.H. (1987). Analysis of factors influencing contributions to pro-environmental organizations using the Ajzen-Fishbein model. (Doctoral dissertation, Teachers College, Columbia University, 1987). Dissertation Abstracts International, 48(7), 2091-B. UMI No. DEV87-21128.

Descriptors: Citizenship Action, Social Research, Instrument Development, Prediction Research, Group Membership, Concern, Verbal Commitment/Intention, Behaviors

644. Johnson, C.D. (1981). A descriptive study of important energy conservation content for industrial arts in North Carolina and potential constraints to the implementation of the content. (Doctoral dissertation, North Carolina State University at Raleigh, 1981). Dissertation Abstracts International, 42(8), 3474-A. UMI No. DEO81-28532.

Descriptors: State Agencies/Programs, Curriculum Development, Program Implementation, Theoretical Research, Descriptive Research, Educational Background, Age, Gender, Knowledge, Perceptions/Beliefs, Attitudes, Vocational Education, Energy Education

645. Johnson, J.A. (1986). The effects of training adolescents in the use of silent probes and extended wait time behaviors for the purpose of eliciting information in oral history interviews with older adults. (Doctoral dissertation, Texas A&M University, 1986). Dissertation Abstracts International, 47(4), 1274-A. UMI No. DES86-14966.

Descriptors: Issue Investigation and Evaluation Skills, Middle/Junior High, Secondary, Psychomotor, Program Evaluation, Pre-Experimental Research, Directed Instruction, Perceptions/Beliefs, Communications

646. Johnson-Carroll, K.J. (1985). Factors that influence energy conservation alterations in Oregon households. (Doctoral dissertation, Oregon State University, 1986). Dissertation Abstracts International, 46(10), 3413-B. UMI No. DES85-27785.

Descriptors: Citizen Action, Social Research, Model Building, Prediction Research, Secondary Analysis, Eductional Background, Economic Background, Age, Gender, Perceptions/Beliefs, Verbal Commitment/Intention, Behaviors, Energy Education

647. Jordan, B.E. (1988). Exporing the sea world: A multidisciplinary secondary curriculum in marine science. (Doctoral dissertation, University of California, Los Angeles, 1988). Dissertation Abstracts International, 49(7), 1753-A. UMI No. DEW88-22188.

Descriptors: Ecology Education, Issue Awareness/Knowledge of Issues, Secondary, Teacher Education Inservice, Curriculum Development, Program Implementation, Theoretical Research, Science Education, Marine Education

648. Judd, M.K. (1989). Effects of object novelty and environmental novelty on cognitive learning in a natural science museum setting. (Doctoral dissertation, Texas A&M University, 1988). Dissertation Abstracts International, 49(11), 3249-A. UMI No. DEW89-03359.

Descriptors: Ecology Education, Museums, Elementary, Program Evaluation, Experimental Research, Environmental Sensitivity, Knowledge, Nature Study

649. Kaelin, M.A. (1982). The development of behavioral objectives for a course in environmental cancer for undergraduate college students. (Doctoral dissertation, Collumbia University Teachers College, 1982). Dissertation Abstracts International, 43(2), 374-A. UMI No. DEO82-15739.

Descriptors: Higher Education, Curriculum Development, Delphi Study, Issue-Based, Health Education

650. Kahn, R.D. (1983). Community education for indigenous renewable energy development: An analysis of an educational strategy. (Doctoral dissertation, University of Massachusetts, 1982). Dissertation Abstracts International, 43(8), 2537-A. UMI No. DEP83-29568.

Descriptors: Community Resources, Adult/Continuing Education, Program Development, Program Evaluation, Pre-Experimental Research, Social Learning Methods, Energy Education

651. Kantar, A.K. (1989). The Indian series books for boys by Dietrich Lange: A critical study of the application of natural history in fifteen novels published between 1912-1930. (Doctoral dissertation, University of Minnesota, 1988). Dissertation Abstracts International, 49(12), 3646-A. UMI No. DEW89-05831.

Descriptors: Wilderness, Historical Research, Document Analysis, Gender, Nature Study, Language Arts Education

652. Kastuck, E.N. (1982). The development of marine education resources pertaining to the blue mussel (Mytilus Edulis L.). (Doctoral dissertation, The Union for Experimenting Colleges and Universities, 1981). Dissertation Abstracts International, 42(9), 3937-A. UMI No. DEO82-04978.

Descriptors: Adult/Continuing Education, Curriculum Development, Theoretical Research, Text-Based, Media-Based, Resource Management Education, Marine Education

653. Keating, K.M. (1983). The social and attitudinal determinants of the behavioral intention to adopt solar energy systems. (Doctoral dissertation, Washington State University, 1982). Dissertation Abstracts International, 43(9), 3119-A. UMI No. DEP83-01313.

Descriptors: Citizenship Action, Social Research, Model Building, Prediction Research, Educational Background, Social Background, Economic Background, Perceptions/Beliefs, Attitudes, Concern, Verbal Commitment/Intention, Energy Education

654. Keaton, M.L. (1981). Solar energy, media, and adult education. (Doctoral dissertation, New Mexico State University, 1980). Dissertation Abstracts International, 41(7), 2858-A. UMI No. DEN80-28590.

Descriptors: Adult/Continuing Education, Descriptive Research, Experimental Research, Text-Based, Media-Based, Aptitude, Knowledge, Energy Education, Communications

655. Keiser, J.F.. (1982). The effects of cognitive style and content organization on the complexity of inquiry in environmental problems. (Doctoral dissertation, Stanford University, 1982). Dissertation Abstracts International, 43(4), 1104-A. UMI No. DEO82-20482.

Descriptors: Ecology Education, Issue Identification and Analysis Skills, Secondary, Program Evaluation, Experimental Research, Disciplinary, Interdisciplinary, Gender, Aptitude, Cognitive Style, Knowledge, Science Education

656. Kesgen, E.J. (1983). The effects of an environmental awareness experience on the creative thinking ability of gifted and talented sixth grade students. (Doctoral dissertation, Texas A&M University, 1982). Dissertation Abstracts International, 44(1), 282-A. UMI No. DEP83-06754.

Descriptors: Elementary, Middle/Junior High, Cognitive, Affective, Program Evaluation, Experimental Research, Gifted/Talented, Outdoor Education

657. Klemm, E.B. (1983). Relationships between selected inservice teacher characteristics and content mastery test scores in a program-specific teacher workshop for secondary marine science. (Doctoral dissertation, University of Hawaii, 1982). Dissertation Abstracts International, 43(9), 2970-A. UMI No. DEP83-02440.

Descriptors: Secondary, Teacher Education Inservice, Program Implementation, Program Evaluation, Pre-Experimental Research, Educational Background, Age, Gender, Environmental Sensitivity, Science Education, Marine Education

658. Knotts, D.M. (1989). Development and validation of an issue oriented conservation education module for fifth grade and sixth grade students. (Doctoral dissertation, Stephen F. Austin State University, 1988). Dissertation Abstracts International, 50(6), 1545-A. UMI No. DEW89-19131.

Descriptors: Elementary, Curriculum Development, Instrument Development, Program Evaluation, Experimental Research, Knowledge, Conservation Education, Resource Management Education

659. Knutson, B.J. (1982). Energy and lifestyle: The development, testing and refinement of a lifestyle expectation index. (Doctoral dissertation, Michigan State University, 1982). Dissertation Abstracts International, 43(5), 1708-A. UMI No. DEO82-24449.

Descriptors: Citizenship Action, Social Research, Instrument Development, Prediction Research, Educational Background, Economic Background, Age, Attitudes, Behaviors, Energy Education

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660. Koballa, T. (1981). The effect of integrative complexity on the systematic design of a persuasive communication for changing attitudes of preservice elementary teachers toward energy conservation. (Doctoral dissertation, The Pennsylvania State University, 1981). *Dissertation Abstracts International*, *42*(6), 2598-A. UMI No. DEN81-20446.

Descriptors: Teacher Education Preservice, Program Evaluation, Experimental Research, Media-Based, Attitudes, Science Education, Energy Education, Communications

661. Kos, D.S. (1983). An analysis of the need for solar energy education in Colorado secondary schools. (Doctoral dissertation, University of Northern Colorado, 1983). *Dissertation Abstracts International*, *44* (8), 2390-A. UMI No. DEQ83-28499.

Descriptors: Secondary, Teacher Education Inservice, Status Study, Needs Assessment, Descriptive Research, Multi-Disciplinary, Concepts, Attitudes, Vocational Education, Energy Education

662. Kot, L.S. (1985). An evaluation of the Oklahoma State Energy Awareness Program at the seventh grade level. (Doctoral dissertation, Oklahoma State University, 1984). *Dissertation Abstracts International*, *45* (12), 3600-A. UMI No. DER85-04366.

Descriptors: Middle/Junior High, State Agencies/Programs, Program Evaluation, Pre-Experimental Research, Lecture, Media-Based, Knowledge, Attitudes, Energy Education

663. Kushler, M.G. (1982). An experimental comparison of alternative methods for promoting energy conservation education in high schools. (Doctoral dissertation, Michigan State University, 1981). *Dissertation Abstracts International*, *42*(8), 3498-B. UMI No. DEO82-02465.

Descriptors: Secondary, Teacher Education Inservice, Program Evaluation, Experimental Research, Attitudes, Behaviors, Energy Education

664. Lacy, M.G. (1982). Why has energy consumption increased? An energy and society approach to the American case. (Doctoral dissertation, University of Kansas, 1981). *Dissertation Abstracts International*, *43*(6), 2109-A. UMI No. DEO82-18767.

Descriptors: Social Research, Historical Research, Theoretical Research, Issue-Based, Energy Education

665. Lakshmanan, L.F. (1983). Factors influencing the effectiveness of inservice education on the utilization of a multi-disciplinary approach to environmental education. (Doctoral dissertation, Memphis State

University, 1983). *Dissertation Abstracts International*, *44*(8), 2447-A. UMI No. DEQ83-27457.

Descriptors: Elementary, Teacher Education, Inservice, Model Building, Program Evaluation, Experimental Research, Multi-Disciplinary, Urban, Perceptions/Beliefs, Attitudes, Behaviors

666. Landes, N.M. (1982). An evaluation of the implementation of energy education curricula in selected classrooms (K-8). (Doctoral dissertation, Michigan State University, 1981). *Dissertation Abstracts International*, *42*(12), 5013-A. UMI No. DEO82-12417.

Descriptors: Elementary, Middle/Junior High, Teacher Education Inservice, Program Implementation, Program Evaluation, Pre-Experimental Research, Naturalistic Research, Educational Background, Knowledge, Attitudes, Science Education, Energy Education

667. Lanier, J.A. (1982). A comparative study of priorities for pre-college marine education objectives in Virginia. (Doctoral dissertation, College of William and Mary, 1982). *Dissertation Abstracts International*, *42* (10), 4385-A. UMI No. DEO82-05602.

Descriptors: Ecology Education, Issue Awareness/Knowledge of Issues, K-12, Curriculum Development, Delphi Study, Group Membership, Knowledge, Attitudes, Marine Education

668. Lantz, H.B. (1983). The effects of advance organizers and subsumers on the understanding of solar energy concepts by eighth grade students. (Doctoral dissertation, University of Virginia, 1982). *Dissertation Abstracts International*, *43*(10), 3205-A. UMI No. DEP83-28596.

Descriptors: Middle/Junior High, Program Evaluation, Experimental Research, Concepts, Knowledge, Science Education, Energy Education

669. Larson, M.A. (1981). An investigation into environmental activism. (Doctoral dissertation, University of Wisconsin - Madison, 1980). *Dissertation Abstracts International*, *42*(1), 8-A. UMI No. DEN81-07037.

Descriptors: Citizenship Action, Social Research, Hypothesis Generation, Descriptive Research, Educational Background, Social Background, Political Views, Urban, Group Membership, Sources of Information, Perceptions/Beliefs, Personal Responsibility, Communications

670. Lavoie, D.R. (1986). A qualitative analysis of the thought processes and related factors involved with the science process skill of predicting using an instructional computer simulation. (Doctoral dissertation, Florida State University, 1986). *Dissertation Abstracts International*, 47(8), 2982-A. UMI No. DET86-26801.

Descriptors: Secondary, Cognitive, Model Building, Naturalistic Research, Multi-Disciplinary, Simulations, Computerized Instruction, Knowledge, Cognitive Strategies, Issue-Based, Science Education

671. Lees, J.R. (1983). The effects of the Energy Environment Simulator on achievement, attitudes, and behavior relative to energy education concepts systematically replicated in higher education. (Doctoral dissertation, University of Akron, 1983). Dissertation Abstracts International, 43(10), 3205-A. UMI No. DEP83-05194.

Descriptors: Higher Education, Program Evaluation, Experimental Research, Computerized Instruction, Lecture, Educational Background, Concepts, Knowledge, Attitudes, Verbal Commitment/Intention, Behaviors, Energy Education

672. Levi, D.J. (1981). The experience of environmental quality in built and natural environments. (Doctoral dissertation, University of Arizona, 1981). Dissertation Abstracts International, 42(3), 1151-B. UMI No. DEN81-18456.

Descriptors: Environmental Sensitivity, Parks/Natural Areas, Social Research, Affective, Model Building, Naturalistic Research, Visual Perceptions/Preferences

673. Lien, V.M. (1981). An analysis of teacher willingness to use innovations in education and marine education. (Doctoral dissertation, Unniversity of Texas at Austin, 1980). Dissertation Abstracts International, 41 (7), 3035-A. UMI No. DEN81-00928.

Descriptors: Teacher Education Inservice, Hypothesis Generation, Prediction Research, Lecture, Field Trips, Perceptions/Beliefs, Verbal Commitment/Intentions, Marine Education

674. Liska, R.W. (1988). The development of a systemic process for enhancing the awareness of the potential for indoor air pollution in schools. (Doctoral dissertation, University of Georgia, 1988). Dissertation Abstracts International, 49(5), 1005-A. UMI No. DEV88-12082.

Descriptors: Issue Identification and Analysis Skills, Elementary, Program Development, Instrument Development, Ex Post Facto Research, Perceptions/Beliefs, Knowledge

675. Lisowski, M. (1987). The effect of field-based learning experiences on students' understanding of selected ecological concepts. (Doctoral dissertation, Ohio State University, 1987). Dissertation Abstracts International, 48(5), 1165-A. UMI No. DET87-17677.

Descriptors: Ecology Education, Outdoor Classrooms, Secondary, Program Evaluation, Experimental Research, Concepts, Knowledge, Outdoor Education, Marine Education

676. Litowitz, L.S. (1986). The development, implementation and evaluation of of an energy and power unit of instruction for junior high school industrial arts/technology education programs. (Doctoral dissertation, University of Minnesota, 1986). Dissertation Abstracts International, 47(9), 3336-A. UMI No. DET86-25864.

Descriptors: Middle/Junior High, Curriculum Development, Program Implementation, Program Evaluation, Theoretical Research, Pre-Experimental Research, Knowledge, Vocational Education, Energy Education

677. Lockhoof, N.F. (1982). A simulation game model for affecting attitudes toward energy conservation. (Doctoral dissertation, University of Texas at Austin, 1982). Dissertation Abstracts International, 43(3), 651-A. UMI No. DE082-17899.

Descriptors: Issue Investigation and Evaluation Skills, Adult/Continuing Education, Model Building, Program Evaluation, Naturalistic Research, Non-Formal, Simulations, Games, Attitudes, Energy Education

678. Lubbers, J. (1984). Identification and characterization of students' attitudes toward technology as related to environmental problems. (Doctoral dissertation, Indiana University, 1984). Dissertation Abstracts International, 45(9), 2826-A. UMI No. DER84-29334.

Descriptors: Higher Education, Model Building, Instrument Development, Descriptive Research, Group Membership, Attitudes, Perceptions/Beliefs, Attitudes, Issue-Based, STS Education

679. Lytle, J.R. (1983). A study of selected attitudinal qualities and the attitude-behavior consistency of adolescents toward energy conservation. (Doctoral dissertation, Texas Tech University, 1983). Dissertation Dissertation Abstracts International, 44(3), 881-A. UMI No. DEP83-16846.

Descriptors: Secondary, Hypothesis Generation, Descriptive Research, Prediction Research, Economic Background, Gender, Attitudes, Behaviors, Energy Education

680. Maghenda, W.M. (1985). Education about environmental issues, conservation and management: A study of form four secondary school pupils' concerns about environmental issues in Kenya. (Doctoral dissertation, Ohio University, 1985). Dissertation Abstracts International, 47(4), 1172-A. UMI No. DES86-13582

Descriptors: Secondary, Curriculum Development, Descriptive Research, Social Background, Economic Background, Residence, Gender, Sources of Information, Concern, Issue-Based, Conservation Education, Resource Management Education, International

681. Makowski, T.J. (1989). The diffusion of conservation technology: A dyad analysis of innovators and their neighbors. (Doctoral dissertation, University of Illinois at Urbana-Champaign, 1988). Dissertation Abstracts International, 50(2), 556-A. UMI No. DEW89-08764.

Descriptors: Citizenship Action, Social Research, Model Building, Descriptive Research, Prediction Research, Sources of Information, Behaviors, Energy Education, Communications

682. Marcinkowski, T. (1989). An analysis of correlates and predictors of responsible environmental behavior. (Doctoral dissertation, So. Illinois University at Carbondale, 1988). Dissertation Abstracts International, 49 (12), 3677-A. UMI No. DEW89-03716.

Descriptors: Citizenship Action, Social Research, Model Building, Prediction Research, Age, Group Membership, Sources of Information, Environmental Sensitivity, Knowledge, Attitudes, Values, Locus of Control/Efficacy, Personal Responsibility, Behaviors

683. Marcus, P.A. (1984). Evaluation of innovativeness as a factor in the adoption of energy efficient housing alternatives. (Doctoral dissertation, Oklahoma State University, 1983). Dissertation Abstracts International, 45(3), 841-B. UMI No. DEQ84-14171.

Descriptors: Social Research, Instrument Development, Ex Post Facto Research, Educational Background, Social Background, Economic Background, Sources of Information, Perceptions/Beliefs, Behaviors, Energy Education

684. Marlatt, S.E. (1981). The design and testing of a survey instrument for nature center day camp programs. (Doctoral dissertation, Michigan State University, 1980). Dissertation Abstracts International, 41(9), 4001-A. UMI No. DEN81-06412.

Descriptors: Ecology Education, Environmental/Nature Centers, Camps/Residential Centers, Instrument Development, Program Evaluation, Naturalistic Research, Non-Formal, Sources of Information, Concepts, Knowledge, Attitudes, Nature Study

685. Marshall, M.J. (1987). Social-psychological correlates of household energy conservation activities. (Doctoral dissertation, Claremont Graduate School, 1987). Dissertation Abstracts International, 48(1), 301-B. UMI No. DET87-09294.

Descriptors: Citizenship Action, Adult/Continuing Education, Social Research, Program Development, Descriptive Research, Economic Background, Behaviors, Energy Education

686. Masini, L. (1982). Survey of visitors to the Archipelago De Los Roques Marine National Park, Venezuela: Their characteristics, behavior and opinions. (Doctoral dissertation, University of Washington, 1982). Dissertation Abstracts International, 43(3), 573-B. UMI No. DE082-18248.

Descriptors: Parks/Natural Areas, Psychomotor, Descriptive Research, Knowledge, Preferences, Behaviors, Resource Management Education, Marine Education, Interpretation, International

687. Massey, O.T. (1982). An application of diffusion of innovation theory in the analysis of attitudes toward the 1982 World's Energy Exposition. (Doctoral dissertation, University of Tennessee, 1982). Dissertation Abstracts International, 43(6), 2042-B. UMI No. DE082-25349.

Descriptors: Social Research, Model Building, Prediction Research, Knowledge, Perceptions/Beliefs, Attitudes, Energy Education

688. Mast, W.H. (1981). The development and testing of methods for infusing energy conservation concepts into industrial education electricity/ electronics curricula. (Doctoral dissertation, Texas A&M University, 1980). Dissertation Abstracts International, 41(7), 2973-A. UMI No. DEN81-01620.

Descriptors: Secondary, Curriculum Development, Program Evaluation, Experimental Research, Multi-Disciplinary, Concepts, Knowledge, Vocational Education, Energy Education

689. McCarley, J.W. (1983). The status of energy education at the secondary school level in the state of Alabama. (Doctoral dissertation, Auburn Unniversity, 1983). Dissertation Abstracts International, 44(7), 2107-A. UMI No. DEQ83-26347.

Descriptors: Middle/Junior High, Secondary, Teacher Education Inservice, Status Study, Descriptive Research, Educational Background, Science Education, Energy Education

690. McCutcheon, L. (1981). Influences of energy conservation education on attitudes and behaviors of selected youths in Piedmont, North Carolina. (Doctoral dissertation, University of North Carolina at Greensboro, 1981). Dissertation Abstracts International, 42(4), 1515-A. UMI No. DEN81-18778.

Descriptors: Citizenship Action, Program Evaluation, Experimental Research, Non-Formal, Educational Background, Group Membership, Residence, Age, Gender, Attitudes, Behaviors, Energy Education

691. McDonnell, K. (1985). Residential energy conservation: Multivariate analysis of innovative behavior. (Doctoral dissertation, University of California, Santa Cruz, 1985). Dissertation Abstracts International, 46(8), 2870-B. UMI No. DES85-23003.

Descriptors: Adult/Continuing Education, Social Research, Model Building, Program Development, Descriptive Research, Educational Background, Economic Background, Residence, Perceptions/Beliefs, Attitudes, Behaviors, Energy Education

692. McStay, J. (1983). Stratification and environmental concern: An examination of the socioeconomic status, nonvertical, and new class hypotheses. (Doctoral dissertation, Washington State University, 1983). Dissertation Abstracts International, 44(3), 868-A. UMI No. DEP83-15237.

Descriptors: Social Research, Model Building, Descriptive Research, Educational Background, Social Background, Economic Background, Perceptions/Beliefs, Concern, Resource Management Education

693. Medina, A. (1983). A visual assessment of children's and environmental educators' urban residential preference patterns. (Doctoral dissertation, University of Michigan, 1983). Dissertation Abstracts International, 44(2), 443-B. UMI No. DEP83-14333.

Descriptors: Middle/Junior High, Teacher Education Inservice, Curriculum Development, Program Development, Urban, Visual Perceptions/Preferences, Resource Management Education

694. Medina-Villaba, A.A. (1984). The administration of environmental knowledge for environmental protection: Foundations for organizational change. (Doctoral dissertation, University of Pittsburgh, 1984). Dissertation Abstracts International, 45(5), 1519-A. UMI No. DEQ84-17399.

Descriptors: Social Research, Model Building, Program Development, Naturalistic Research, Group Membership, Knowledge

695. Merfeld, M.K. (1983). Consumer attitudes toward potentially restrictive energy conservation regulations. (Doctoral dissertation, Oregon State University, 1984). Dissertation Abstracts International, 45(5), 1316-A. UMI No. DEQ84-18172.

Descriptors: Issue Investigation and Evaluation Skills, Social Research, Delphi Study, Prediction Research, Secondary Analysis, Educational Background, Residence, Age, Gender, Perceptions/Beliefs, Attitudes, Locus of Control/Efficacy, Issue-Based, Energy Education

696. Merkley, S.L. (1981). The effect of past experience on current energy consumption and conservation patterns: The interaction of historical time, social time and life time. (Doctoral dissertation, Michigan State University, 1981). Dissertation Abstracts International, 42(2), 579-A. UMI No. DEN81-17253.

Descriptors: Social Research, Hypothesis Generation, Prediction Research, Economic Background, Age, Environmental Sensitivity, Attitudes, Behaviors, Energy Education

697. Meszar, R.K. (1982). Education and energy. (Doctoral dissertation, Arizona State University, 1982). Dissertation Abstracts International, 43(5), 1354-A. UMI No. DEO82-17997.

Descriptors: Secondary, Psychomotor, Program Evaluation, Experimental Research, Media-Based, Discussion, Knowledge, Behaviors, Energy Education

698. Miller, J.M. (1981). Recently proposed alternatives to a mechanistic view of nature and implications of such alternative views for science education. (Doctoral dissertation, Auburn University, 1980). Dissertation Abstracts International, 41(10), 4350-A. UMI No. DEN81-07126.

Descriptors: Program Development, Curriculum Development, Historical Research, Theoretical Research, Nature Study, Outdoor Education, Science Education

699. Miller, K.C. (1984). Decision-making on the implementation of energy conservation measures as influenced by the utility company energy audit. (Doctoral dissertation, University of Tennessee, 1984). Dissertation Abstracts International, 45(6), 1744-B. UMI No. DEQ84-21400.

Descriptors: Issue Investigation and Evaluation Skills, Social Research, Model Building, Program Evaluation, Descriptive Research, Prediction Research, Economic Background, Residence, Perceptions/Beliefs, Attitudes, Behaviors, Energy Education

700. Miller, S. (1983). Environmental values underlying positions taken toward environmental issues. (Doctoral dissertation, Southern Illinois University at Carbondale, 1982). Dissertation Abstracts International, 43(7), 2451-A. UMI No. DEP82-29298.

Descriptors: Issue Identification and Analysis Skills, Social Research, Model Building, Descriptive Research, Group Membership, Values, Moral Development, Issue-Based

701. Mitchell, B.B. (1982). An analysis of three models for assessing continuing education needs of environmental occupation practitioners. (Doctoral dissertation, Florida State University, 1982). Dissertation Abstracts International, **43**(3), 691-A. UMI No. DEO82-18648.
Descriptors: Adult/Continuing Education, Model Building, Needs Assessment, Program Development, Descriptive Research, Vocational Education

702. Mohai, P. (1984). Actual and apparent elitism in the environmental-conservation movement: Analysis through a theoretical model of political participation. (Doctoral dissertation, The Pennsylvania University, 1983). Dissertation Abstracts International, **44**(8), 2601-A. UMI No. DA83-27529.

Descriptors: Citizenship Action, Social Research, Model Building, Theoretical Research, Secondary Analysis, Social Background, Economic Background, Concern, Behaviors, Issue-Based

703. Molinari, J.A. (1983). Environmental studies at the undergraduate level: Curriculum and integration of knowledge. (Doctoral dissertation, The Pennsylvania State University, 1982). Dissertation Abstracts International, **43**(10), 3235-A. UMI No. DEP83-05676.

Descriptors: Higher Education, Status Study, Descriptive Research, Document Analysis, Interdisciplinary, Multi-Disciplinary, Discussion, Lecture, Science Education, Social Studies Education

704. Moore, D.E. (1983). The effects of guided experiences with animals on the beliefs, attitudes, behavioral intentions and knowledge of children. (Doctoral dissertation, University of Wyoming, 1983). Dissertation Abstracts International, **44**(9), 2727-A. UMI No. DEP83-27767.

Descriptors: Elementary, Middle/Junior High, Instrument Development, Program Evaluation, Experimental Research, Gender, Knowledge, Perceptions/Beliefs, Attitudes, Verbal Commitment/Intention, Nature Study

705. Morton, C.S. (1981). The influence of winter interdisciplinary outdoor education program on middle school students' attitudes and knowledge about the outdoor environment. (Doctoral dissertation, University of Akron, 1981). Dissertation Abstracts International, **41**(8), 3518-A. UMI No. DEN81-02798.

Descriptors: Environmental Sensitivity, Camps/Residential Centers, Middle/Junior High, Program Evaluation, Experimental Research, Interdisciplinary, Attitudes, Knowledge, Outdoor Education

706. Mseka, L.K. (1983). Economics and agricultural extension training: A curriculum development program for the Natural Resources College of Malawi. (Doctoral dissertation, Ohio University, 1981). Dissertation Abstracts International, 43(10), 3207-A. UMI No. DEP83-04359.

Descriptors: Higher Education, Teacher Education Preservice, Model Building, Curriculum Development, Descriptive Research, Concepts, Knowledge, Perceptions/Beliefs, Resource Management Education, Vocational Education

707. Naseth, G.J. (1990). The effects of warnings of impending resource depletion, resource control and environmental attitudes on behavior in a social dilemma. (Doctoral dissertation, University of Nevada, 1989). Dissertation Abstracts International, 51(3), 1549-B. UMI No. DEX90-20396.

Descriptors: Issue Investigation and Evaluation Skills, Psychomotor, Program Evaluation, Experimental Research, Simulations, Moral/Values Education, Knowledge, Cognitive Strategies, Attitudes, Concern, Behaviors, Resource Management Education

708. Neuman, K.A. (1983). Personal values and individuals' commitment to resource conservation. (Doctoral dissertation, University of California, Irvine, 1982). Dissertation Abstracts International, 43(9), 3077-B. UMI No. DEP83-03539.

Descriptors: Citizenship Action, Social Research, Model Building, Program Development, Descriptive Research, Perceptions/Beliefs, Attitudes, Values, Personal Responsibility, Verbal Commitment/Intention, Behaviors, Energy Education

709. Newhouse, C. (1986). An investigation of the relationship between environmental behaviors and personality factors in church members and environmentalists. (Doctoral dissertation, Michigan State University, 1985). Dissertation Abstracts International, 46(12, Part 1), 3884-A. UMI No. DES86-03459.

Descriptors: Citizenship Action, Social Research, Hypothesis Generation, Descriptive Research, Group Membership, Personality Type, Values, Verbal Commitment/Intention, Behaviors, Religious Education

710. Newitt, J.S. (1981). The relationship between attitudes, knowledge, and construction, and their effect on residential energy consumption. (Doctoral dissertation, Colorado State University, 1981). Dissertation Abstracts International, 42(3), 1118-A. UMI No. DEN81-19719.

Descriptors: Citizenship Action, Social Research, Hypothesis Generation, Ex Post Facto Research, Residence, Knowledge, Attitudes, Behaviors, Energy Education

711. Nji, A. (1981). The application of a conventional adoption-diffusion model to the adoption of soil conservation practices by Iowa farmers: The interface of technology, social change and development. (Doctoral dissertation, Iowa State University, 1980). Dissertation Abstracts International, 41(9), 4169-A. UMI No. DEN81-06038.

Descriptors: Citizenship Action, National Agencies/Programs, Social Research, Hypothesis Generation, Program Development, Descriptive Research, Residence, Perceptions/Beliefs, Behaviors, Conservation Education, Vocational Education, International

712. Noibi, A.S. (1981). Relationships between moral reasoning levels and selected environmental variables among teachers in Nigeria. (Doctoral dissertation, University of Iowa, 1981). Dissertation Abstracts International, 42(7), 3094-A. UMI No. DEO81-28445.

Descriptors: Citizenship Action, Teacher Education Preservice, Teacher Education Inservice, Hypothesis Generation, Ex Post Facto Research, Group Membership, Knowledge, Attitudes, Moral Development, Verbal Commitment/Intention, Behaviors, International

713. Nolan, L.M. (1986). An investigation into the perceptions of middle/junior high public school teachers concerning the quality and effectiveness of free and inexpensive industry designed instructional materials. (Doctoral dissertation, Boston College, 1986). Dissertation Abstracts International, 47(5), 1593-A. UMI No. DES86-16111.

Descriptors: Middle/Junior High, Teacher Education Inservice, Psychomotor, Program Implementation, Program Evaluation, Descriptive Research, Document Analysis, Perceptions/Beliefs, Energy Education

714. Norville, H.A. (1982). A sociological analysis of the relationship between level of participation in environmental decision-making and selected structural and social psychological variables. (Doctoral dissertation, Purdue University, 1981). Dissertation Abstracts International, 42(8), 3765-A. UMI No. DEO82-00703.

Descriptors: Citizenship Action, Social Research, Model Building, Descriptive Research, Social Background, Economic Background, Age, Gender, Group Membership, Concern, Locus of Control/Efficacy, Behaviors

715. Nycum, S.L. (1989). An educational approach to the study of water quality environments of rivers and streams. (Doctoral dissertation, University of Tennessee, 1988). Dissertation Abstracts International, 50(3), 617-A. UMI No. DEW89-11743.

Descriptors: Issue Investigation and Evaluation Skills, Community Resources, Secondary, Higher Education, Curriculum Development, Program

Implementation, Pre-Experimental Research, Investigation/Inquiry

716. O'Brien, E.F. (1984). A comparison of attitudinal and achievement outcomes of innovative and conventional energy education units. (Doctoral dissertation, University of Maryland, 1983). Dissertation Abstracts International, 45(6), 1711-A. UMI No. DEQ84-19542.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Program Evaluation, Experimental Research, Text-Based, Gender, Concepts, Knowledge, Attitudes, Science Education, Energy Education

717. O'Connor, S.F. (1983). An ethnographic investigation of the impact of a residential outdoor education program on self-esteem and attitudes to the outdoors of 5th and 7th grade students. (Doctoral dissertation, Catholic University of America, 1983). Dissertation Abstracts International, 44(2), 376-A. UMI No. DEP83-14897.

Descriptors: Camps/Residential Centers, Elementary, Middle/Junior High, Program Evaluation, Pre-Experimental Research, Naturalistic Research, Gender, Environmental Sensitivity, Attitudes, Outdoor Education

718. Okoye, P.I. (1986). The identification of rural public health sanitarian competancies for developing countries. (Doctoral dissertation, Oregon State University, 1985). Dissertation Abstracts International, 47(4), 1199-A. UMI No. DES86-14755.

Descriptors: Teacher Education Inservice, Curriculum Development, Delphi Study, Residence, Perceptions/Beliefs, Vocational Education, Health Education, International

719. Oloke, L. (1982). A comparative study of an indoor-outdoor laboratory method with a traditional method of teaching ecology in a secondary school in Nigeria. (Doctoral dissertation, University of Northern Colorado, 1981). Dissertation Abstracts International, 42(10), 4386-A. UMI No. DEO82-06179.

Descriptors: Ecology Education, Secondary, Teacher Education Inservice, National Agencies/Programs, Program Evaluation, Curriculum Development, Experimental Research, Directed Instruction, Laboratory-Based, Knowledge, Attitudes, Outdoor Education, Science Education, International

720. Olson, E.C. (1983). Nonformal environmental education in natural resources management: A case study in the use of interpretation as a management tool for a state nature preserve system. (Doctoral dissertation, Ohio State University, 1983). Dissertation Abstracts International, 44(4), 1047-A. UMI No. DEP83-18415.

Descriptors: Parks/Natural Areas, Social Research, Program Development, Program Evaluation, Descriptive Research, Economic Background, Age, Gender, Environmental Sensitivity, Knowledge, Attitudes, Resource Management Education, Interpretation

721. Olson Sass, S.A. (1987). The current status of energy education at the secondary level in Nebraska public schools. (Doctoral dissertation, University of Nebraska - Lincoln, 1986). Dissertation Abstracts International, 47(11), 3965-A. UMI No. DET87-04562.

Descriptors: Secondary, Teacher Education Inservice, Status Study, Descriptive Research, Multi-Disciplinary, Text-Based, Educational Background, Perceptions/Beliefs, Science Education, Social Studies Education, Vocational Education, Energy Education

722. Olsson, T.L. (1988). Population growth, poverty, religion - Problems of objectivity in Swedish school textbooks, with special emphasis on their views of India and developing countries. (Doctoral dissertation, Lunds Universitet, Sweden, 1988). Dissertation Abstracts International, 49(3), 341-C. UMI No. DEVCO-33097.

Descriptors: K-12, Program Evaluation, Theoretical Research, Document Analysis, Text-Based, Issue-Based, Social Studies Education, Population Education, Religious Education, International

723. Ortiz, J.A. (1987). Energy education in women's magazines: A seventy year history, 1914-1984. (Doctoral dissertation, State University of New York at Buffalo, 1987). Dissertation Abstracts International, 48(10), 2747-A. UMI No. DEV87-27729.

Descriptors: Social Research, Historical Research, Document Analysis, Energy Education, Communications

724. Osman, M. (1984). Evaluation of the population and development program's impact on family planning in rural Egypt. (Doctoral dissertation, Cornell University, 1984). Dissertation Abstracts International, 45(5), 1530-A. UMI No. DEQ84-15312.

Descriptors: Citizenship Action, National Agencies/Programs, Social Research, Program Evaluation, Prediction Research, Secondary Analysis, Social Background, Economic Background, Residence, Behaviors, Population Education, International

725. Pace, R. (1987). Urban environmental education in the intermediate grade curriculum: A case study of content and process. (Doctoral dissertation, St. John's University, 1987). Dissertation Abstracts International, 47(11), 3965-A. UMI No. DET87-04260.

Descriptors: Elementary, Teacher Education Inservice, Program Implementation, Naturalistic Research, Multi-Disciplinary, Field Trip, Urban, Knowledge, Perceptions/Beliefs, Mathematics Education, Language Arts Education, Science Education, Social Studies Education

726. Padmanabhan, K. (1982). A hierarchical model of the causal relations between environmental attitudes, beliefs, and behaviors with specific data relating to the recycling of beer cans. (Doctoral dissertation, Michigan State University, 1981). Dissertation Abstracts International, 43(3), 910-A. UMI No. DA 82-12436.

Descriptors: Citizenship Action, Social Research, Model Building, Descriptive Research, Prediction Research, Perceptions/Beliefs, Attitudes, Behaviors

727. Page, V.L. (1984). The politics of environmental preservation and utilization: A clash of economic and lifestyle issues. (Doctoral dissertation, University of Oklahoma, 1984). Dissertation Abstracts International, 45(7), 2276-A. UMI No. DER84-23993.

Descriptors: Issue Investigation and Evaluation Skills, Social Research, Hypothesis Generation, Descriptive Research, Social Background, Political Views, Residence, Urban, Age, Concern, Preferences

728. Parent, F.D. (1984). The adoption and diffusion of environmental innovations in agriculture. (Doctoral dissertation, Purdue University, 1984). Dissertation Abstracts International, 45(7), 2276-A. UMI No. DER84-23407.

Descriptors: Citizenship Action, Social Research, Model Building, Pre-Experimental Research, Behaviors, Vocational Education, Communications

729. Perkins, S.F. (1986). Integrating undergraduate science programs: An ethnographic study of an integrated natural resources program. (Doctoral dissertation, Washington University, 1986). Dissertation Abstracts International, 47(8), 2983-A. UMI No. DET86-26395.

Descriptors: Outdoor Classrooms, Higher Education, Program Development, Program Evaluation, Naturalistic Research, Interdisciplinary, Field Trip, Concepts, Resource Management Education, Science Education

730. Peters-Grant, V.M. (1987). The influence of life experiences in the vocational interests of volunteer environmental workers. (Doctoral dissertation, University of Maine, 1986). Dissertation Abstracts International, 47(10), 3744-A. UMI No. DET87-03323.

Descriptors: Environmental Sensitivity, Social Research, Hypothesis Generation, Naturalistic Research, Gender, Outdoor Education, Vocational Education, Marine Education

731. Peterson, E. (1984). Evaluating interpretive center of the United States: An ethnographic study. (Doctoral dissertation, University of Michigan, 1984). Dissertation Abstracts International, 45(2), 639-A. UMI No. DEQ84-12226.

Descriptors: Environmental/Nature Centers, Status Study, Program Evaluation, Naturalistic Research, Non-Formal, Interpretation

732. Phillip, M.J. (1984). Evaluation of a nuclear energy psychoeducational program on knwoledge, attitudes, and beliefs of youth. (Doctoral dissertation, DePaul University, 1984). Dissertation Abstracts International, 45(2), 684-B. UMI No. DEQ84-11298.

Descriptors: Issue Awareness/Knowledge of Issues, Middle/Junior High, Program Evaluation, Experimental Research, Directed Instruction, Perceptions/Beliefs, Knowledge, Attitudes, Energy Education

733. Pindas-Chernoloujsky, P. (1982). Mexican leaders' roles and perceptions of population growth, policies and programs. (Doctoral dissertation, University of Minnesota, 1981). Dissertation Abstracts International, 43(1), 274-A. UMI No. DEO82-11526.

Descriptors: Social Research, Status Study, Descriptive Research, Educational Background, Economic Background, Group Membership, Perceptions/Beliefs, Knowledge, Attitudes, Population Education, International

734. Pomerantz, G.A. (1985). The influence of "Ranger Rick" magazine on children's perceptions of natural resource issues. (Doctoral dissertation, North Carolina State Unniversity at Raleigh, 1985). Dissertation Abstracts International, 46(6), 1585-A. UMI No. DER85-18274.

Descriptors: Elementary, Program Evaluation, Descriptive Research, Experimental Research, Document Analysis, Media-Based, Age, Gender, Sources of Information, Knowledge, Issue-Based, Science Education, Communications

735. Ponder, S.E. (1985). News management in the Progressive Era, 1898-1909: Gifford Pinchot, Theodore Roosevelt and the conservation crusade. (Doctoral dissertation, University of Washington, 1985). Dissertation Abstracts International, 46(10), 2843-A. DES85-29935.

Descriptors: National Agencies/Programs, Hypothesis Generation, Historical Research, Conservation Education, Resource Management Education, Communications

736. Puntenney, P.J. (1983). The unity of learning: A systems perspective on environmental education. (Doctoral dissertation, University of Michigan, 1983). *Dissertation Abstracts International*, *44*(9), 2727-A. UMI No. DEQ83-24268.

Descriptors: Elementary, Program Development, Program Evaluation, Naturalistic Research, Formal, Interdisciplinary, International

737. Ramsey, J. (1989). A study of the effects of issue investigation and action training on characteristics associated with environmental behavior in seventh grade students. (Doctoral dissertation, So. Illinois University at Carbondale, 1987). *Dissertation Abstracts International*, *49*(7), 1754-A. UMI No. DEW88-17245.

Descriptors: Issue Investigation and Evaluation Skills, Citizenship Action, Middle/Junior High, Teacher Education Inservice, Program Evaluation, Experimental Research, Inquiry/Investigation, Text-Based, Environmental Sensitivity, Knowledge, Locus of Control/Efficacy, Behaviors

738. Rhein, R.R. (1981). Land use as a central theme in environmental education. (Doctoral dissertation, Lehigh University, 1980). *Dissertation Abstracts International*, *41*(7), 2919-A. UMI No. DEN81-02515.

Descriptors: Middle/Junior High, Secondary, Curriculum Development, Theoretical Research, Multi-Disciplinary

739. Rice, D.T. (1983). A programmed text introducing the effects of air pollution. (Doctoral dissertation, Indiana University, 1982). *Dissertation Abstracts International*, *44*(4), 995-A. UMI No. DEP83-16938.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Curriculum Development, Program Evaluation, Pre-Experimental Research, Directed Instruction, Text-Based, Knowledge, Health Education

740. Riposo Freimark, N.A. (1987). The public, the news media and environmental issues: The role of the news media in the relationship between need for orientation about two environmental issues and perceptions of issue salience. (Doctoral dissertation, Syracuse University, 1986). *Dissertation Abstracts International*, *47*(9), 3227-A. UMI No. DET87-01261.

Descriptors: Adult/Continuing Education, Hypothesis Generation, Descriptive Research, Educational Background, Residence, Sources of Information, Perceptions/Beliefs, Attitudes, Issue-Based, Communications

741. Robottom, I. M. (1985). Contestation and continuity in educational reform: A critical study of innovations in environmental education. (Doctoral dissertation, Deakin University, Australia, 1985). Not Available through Dissertation Abstracts International. ERIC: ED 278535 SE 047618.

Descriptors: Program Development, Program Implementation, Program Evaluation, Model Building, Theoretical Research, Formal, Issue-Based

742. Rosenbaum, M. (1987). Effects of information upon moral reasoning levels of eighth grades confronted with environmental moral dilemmas. (Doctoral dissertation, Rutgers The State University of New Jersey - New Brunswick, 1987). Dissertation Abstracts International, 48(12), 3044-A. UMI No. DEV87-27329.

Descriptors: Middle/Junior High, Program Evaluation, Experimental Research, Values/Moral Education, Gender, Moral Development, STS Education

743. Salwen, M.B. (1985). Agenda setting with environmental issues: A study of the time process, audience salience, audience dependency, and newspaper reading. (Doctoral dissertation, Michigan State University, 1985). Dissertation Abstracts International, 46(7), 1770-A. UMI No. DES85-20557.
Descriptors: Issue Awareness/Knowledge of Issues, Adult/Continuing Education, Hypothesis Generation, Ex Post Facto Research, Media-Based, Sources of Information, Perceptions/Beliefs, Communications

744. Santos, J.G. (1988). Nature's classroom: It's short and long-term impact on students. (Doctoral dissertation, Boston College, 1987). Dissertation Abstracts International, 49(4), 720-A. UMI No. DEV88-07558.

Descriptors: Camps/Residential Centers, Elementary, Cognitive, Affective, Program Evaluation, Experimental Research, Non-Formal, Moral Development, Nature Study

745. Schoenfeld, M.J. (1981). The influence of in-service teacher training on students' cognitive and affective growth during a residential program in environmental education. (Doctoral dissertation, University of Northern Colorado, 1980). Dissertation Abstracts International, 41(10), 4350-A. UMI No. DEN81-08243.

Descriptors: Ecology Education, Camps/Residential Centers, Elementary, Teacher Education Inservice, Program Evaluation, Experimental Research, Field Trip, Educational Background, Residence, Knowledge, Attitudes, Outdoor Education

746. Schreckengost, R.L. (1986). Energy-efficient housing alternatives: A predictive model of factors affecting household perceptions. (Doctoral dissertation, Virginia Polytechnic Institute and State University, 1985). Dissertation Abstracts International, 47(1), 160-B. UMI No. DES86-05459.

Descriptors: Citizenship Action, Social Research, Model Building, Prediction Research, Educational Background, Economic Background, Residence, Age, Perceptions/Beliefs, Attitudes, Behaviors, Energy Education

747. Sellers, J.A. (1989). Dropout of volunteer teachers (docents) in zoos and natural history museums. (Doctoral dissertation, University of Southern California, 1988). Dissertation Abstracts International, 50(1), 54-A. Copies available through Micrographics Department; Univ. of So. California; Los Angeles, CA 90089-0182.

Descriptors: Museums, Teacher Education Inservice, Hypothesis Generation, Model Building, Prediction Research, Non-Formal, Attitudes, Nature Study, Interpretation

748. Shaer, A.I. (1984). A needs assessment survey for the development of a plan for the modification and expansion of the Natural History Museum of Saudi Arabia. (Doctoral dissertation, University of Pittsburgh, 1984). Dissertation Abstracts International, 45(2), 388-A. UMI No. DEQ84-11812.

Descriptors: Museum, Community Resources, Needs Assessment, Program Development, Descriptive Research, Non-Formal, Nature Study, Interpretation, International

749. Shorett, J.E. (1986). Residential energy conservation: A threshold model. (Doctoral dissertation, University of Michigan, 1986). Dissertation Abstracts International, 47(6), 2326-A. UMI No. DES86-21375.

Descriptors: Citizenship Action, Social Research, Model Building, Program Development, Descriptive Research, Sources of Information, Perceptions/Beliefs, Behaviors, Energy Education

750. Showers, D.E. (1986). A study of the effects of informational and persuasive messages on the attitudes of high school students toward the use of nuclear energy for electrical production. (Doctoral dissertation, The Pennsylvania State University, 1986). Dissertation Abstracts International, 47(7), 2441-A. UMI No. DET86-23801.

Descriptors: Issue Awareness/Knowledge of Issues, Secondary, Program

Evaluation, Experimental Research, Media-Based, Gender, Knowledge, Attitudes, Energy Education

751. Shuman, J.C. (1983). Construction of a college-level curriculum model for professional preparation in environmental interpretation. (Doctoral dissertation, West Virginia University, 1983). Dissertation Abstracts International, 44(4), 979-A. UMI No. DEP83-18762.

Descriptors: Higher Education, Teacher Education Inservice, Model Building, Curriculum Development, Program Evaluation, Theoretical Research, Interpretation

752. Sia, A. (1985). An investigation of selected predictors of overt responsible environmental behavior. (Doctoral dissertation, Southern Illinois University at Carbondale, 1984). Dissertation Abstracts International, 46(3), 667-A. UMI No. DER85-10064.

Descriptors: Citizenship Action, Social Research, Model Building, Curriculum Development, Prediction Research, Group Membership, Personality Type, Environmental Sensitivity, Knowledge, Attitudes, Locus of Control/Efficacy, Behaviors

753. Simmons, D. (1983). The use of National Park planning workbooks for citizen participation: Enhancing effective communication. (Doctoral dissertation, University of Michigan, 1984). Dissertation Abstracts International, 44(2), 596-A. UMI No. DEP83-14357.

Descriptors: Citizenship Action, Parks/Natural Areas, Adult/Continuing Education, National Agencies/Programs, Program Evaluation, Knowledge, Attitudes, Communication

754. Singletary, T.J. (1982). Perceptions of environmental education in Illinois public high schools. (Doctoral dissertation, University of Illinois at Urbana-Champaign, 1981). Dissertation Abstracts International, 42(9), 3940-A. UMI No. DEO82-03589.

Descriptors: Secondary, Teacher Education Inservice, Cognitive, Curriculum Development, Program Implementation, Theoretical Research, Naturalistic Research, Perceptions/Beliefs, Knowledge, Values, Behaviors, Science Education

755. Sivek, D. (1989). An analysis of selected predictors of environmental behavior of three conservation organizations. (Doctoral dissertation, Southern Illinois University at Carbondale, 1988). Dissertation Abstracts International, 49(11), 3322-A. UMI No. DEW89-03709.

Descriptors: Citizenship Action, Social Research, Model Building, Prediction Research, Group Membership, Personality Type, Environmental Sensitivity, Knowledge, Attitudes, Locus of Control/Efficacy, Behaviors

756. Smith, G.A. (1989). Educating for sustainablility: The educational implications of the environmental crisis. (Doctoral dissertation, University of Wisconsin - Madison, 1989). Dissertation Abstracts International, 50(11), 3420-A. UMI No. DEX89-23814.

Descriptors: K-12, Model Building, Program Development, Theoretical Research, Formal, Issue-Based

757. Smith, P.M. (1981). A measurement of the effectiveness of a museum outreach van versus guided museum attendance on certain science knowledge of two socio-economic groups of children. (Doctoral dissertation, University of Texas at Austin, 1981). Dissertation Abstracts International, 42(7), 3095-A. UMI No. DEN81-28691.

Descriptors: Ecology Education, Musuems, Elementary, Program Evaluation, Experimental Research, Social Background, Economic Background, Knowledge, Science Education

758. Snively, G. (1987). Sea of images: A study of the relationships among students' orientations and beliefs, and science instruction. (Doctoral dissertation, University of British Columbia, 1986). Dissertation Abstracts International, 48(2), 355-A. UMI No. DE _______________.

Descriptors: Ecology Education, K-12, Program Evaluation, Naturalistic Research, Environmental Sensitivity, Concepts, Perceptions/Beliefs, Knowledge, Values, Science Education, Marine Education

759. Solberg, S.L. (1983). The role of mediators in environmental disputes: A dialectic debate. (Doctoral dissertation, University of Michigan, 1983). Dissertation Abstracts International, 44(2), 591-A. UMI No. DEP83-14359.

Descriptors: Issue Identification and Analysis Skills, Issue Investigation and Evaluation Skills, Values Clarification Skills, Model Building, Descriptive Research, Document Analysis

760. Souza, R. (1985). Marine science: Knowledge and attitudes of high school students. (Doctoral dissertation, Boston University, 1984). Dissertation Abstracts International, 46(2), 393-A. UMI No. DER85-08929.

Descriptors: Secondary, Program Evaluation, Experimental Research, Formal, Residence, Sources of Information, Knowledge, Attitudes, Science Education, Marine Education

761. Srichai, N.K. (1989). A study of environmental perceptions and attitudes of selected university students in Thailand. (Doctoral dissertation, University of Iowa, 1988). Dissertation Abstracts International, 50(4), 833-A. UMI No. DEW89-13239.

Descriptors: Higher Education, Status Study, Descriptive Research, Educational Background, Residence, Gender, Sources of Information, Perceptions/Beliefs, Attitudes, Values, Issue-Based, International

762. Stagliano, R.A. (1981). The effects of the Energy Environment Simulator and U.S. Energy Policy Game on achievement, attitudes, and behavior relative to energy concepts in a community college. (Doctoral dissertation, University of Akron, 1981). Dissertation Abstracts International, 41(10), 4351-A. UMI No. DEN81-07426.

Descriptors: Issue Awareness/Knowledge of Issues, Higher Education, Program Evaluation, Experimental Research, Lecture, Discussion, Simulations, Games, Concepts, Knowledge, Attitudes, Verbal Commitment/ Intention, Behaviors, Energy Education

763. Stankiewicz, J.J. (1984). The effects of an advance organizer on the ability of randomly selected groups of seventh and eighth grade science students to recall, and apply facts after a visit to a science museum. (Doctoral dissertation, Temple University, 1984). Dissertation Abstracts International, 45(1), 143-A. UMI NO. DEQ84-10162.

Descriptors: Museums, Middle/Junior High, Program Evaluation, Experimental Research, Non-Formal, Gender, Concepts, Knowledge, Attitudes, Science Education, Interpretation

764. Stephen, C.R. (1984). Changes in the status of conservation education in selected institutions of higher education in the southeastern United States. (Doctoral dissertation, Ohio State University, 1984). Dissertation Abstracts International, 45(6), 1713-A. UMI No. DEQ84-19016.

Descriptors: Higher Education, Status study, Program Development, Descriptive Research, Delphi Study, Conservation Education

765. Sterner, D.W. (1982). Teaching environmental education concepts using Landsat images: A module for gifted/talented students. (Doctoral dissertation, University of Montana, 1982). Dissertation Abstracts International, 43(5), 1491-A. UMI No. DEO82-24250.

Descriptors: Middle/Junior High, Program Development, Program Evaluation, Pre-Experimental Research, Naturalistic Research, Interdisciplinary, Individualized Instruction, Media-Based, Gifted/Talented, Concepts, Knowledge

766. Stever, C.J. (1985). Direct and indirect effect of change in family structure and lifestyle upon energy consumption. (Doctoral dissertation, University of Cincinnati, 1985). Dissertation Abstracts International, 46(8), 2451-A. UMI No. DES85-18154.

Descriptors: Citizenship Action, Social Research, Hypothesis Generation, Historical Research, Secondary Analysis, Economic Background, Residence, Behaviors, Energy Education

767. Stone, C.B. (1984). From forests to fields to food webs: The environment in history and biology textbooks, 1905-1975. (Doctoral dissertation, Stanford University, 1984). Dissertation Abstracts International, 45 (6), 1665-A. UMI No. DEQ84-20621.

Descriptors: Ecology Education, Historical Research, Document Analysis, Text-Based, Perceptions/Beliefs, Personal Responsibility, Conservation Education, Science Education, Social Studies Education

768. Stout-Wiegand, N. (1985). Development of a short scale of environmental concern. (Doctoral dissertation, West Virginia University, 1985). Dissertation Abstracts International, 46(8), 2241-A. UMI No. DES85-23753.

Descriptors: Adult/Continuing Education, Social Research, Instrument Development, Theoretical Research, Descriptive Research, Concern, Issue-Based

769. Stubbs, H.S. (1983). Factors influencing introduction of a current environmental topic into the curriculum. (Doctoral dissertation, University of Minnesota, 1982). Dissertation Abstracts International, 43(11), 3503-A. UMI No. DEP83-08131.

Descriptors: Teacher Education Inservice, Program Implementation, Ex Post Facto Research, Media-Based, Laboratory-Based, Educational Background, Gender, Attitudes, Issue-Based

770. Subhakul, M. (1982). Curriculum inferences for secondary school teachers in population education within the school system of Thailand. (Doctoral dissertation, East Tennessee State University, 1981). Dissertation Abstracts International, 42(11), 4682-A. UMI No. DEO82-07859.

Descriptors: Secondary, Higher Education, Teacher Education Inservice, National Agencies/Programs, Needs Assessment, Curriculum Development, Descriptive Research, Population Education, International

771. Sudderth, P.L. (1984). An assessment of energy knowledge and attitudes of selected eighth grade students in the southwest educational region of North Carolina. (Doctoral dissertation, University of South Carolina,

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1984). Dissertation Abstracts International, 45(5), 1290-A. UMI No. DEQ84-19081.

Descriptors: Middle/Junior High, Teacher Education Inservice, Status Study, Descriptive Research, Prediction Research, Ethnic Background, Residence, Gender, Knowledge, Attitudes, Energy Education

772. Sugai, W. (1984). The ratepayers' revolt and the Washington Public Power Supply System crisis (WPSS). (Doctoral dissertation, University of Washington, 1985). Dissertation Abstracts International, 46(7), 2063-A. UMI No. DES85-21665.

Descriptors: Issue Identification and Analysis Skills, Citizenship Action, Social Research, Historical Research, Group Membership, Behaviors, Energy Education

773. Sumartojo, E. (1983). Exploring the context of comsumption: An examination of the relationship between value orientation and the use of energy. (Doctoral dissertation, George Peabody College for Teachers, Vanderbilt University, 1983). Dissertation Abstracts International, 44(4), 1282-B. UMI No. DEP83-19081.

Descriptors: Citizenship Action, Social Research, Hypothesis Generation, Prediction Research, Economic Background, Group Membership, Age, Gender, Values, Behaviors, Energy Education

774. Swanson, R.W. (1982). The influence of students' values on behavior related variables in environmental education. (Doctoral dissertation, Indiana University, 1981). Dissertation Abstracts International, 42(8), 3537-A. UMI No. DEO82-00898.

Descriptors: Ecology Education, Secondary, Affective, Hypothesis Generation, Program Evaluation, Experimental Research, Prediction Research, Residence, Knowledge, Values, Verbal Commitment/Intention, Behaviors

775. Swearingen, T.C. (1990). Moral development and environmental ethics. (Doctoral dissertation, University of Washington, 1989). Dissertation Abstracts Interntional, 50(12), 5905-B. UMI No. DEX90-13821.

Descriptors: Parks/Natural Areas, Social Research, Model Building, Instrument Development, Theoretical Research, Ex Post Facto Research, Educational Background, Age, Moral Development, Behaviors, Values/Moral Education

776. Sy, K.J. (1984). Energy and environmental policy making in Wisconsin state government: University faculty participation and input. (Doctoral dissertation, University of Wisconsin - Madison, 1984). Dissertation Abstracts International, 45(9), 2989-A. UMI No. DER84-17978.

Descriptors: Citizenship Action, Higher Education, State Agencies/Programs, Status Study, Model Building, Naturalistic Research, Educational Background, Knowledge, Attitudes, Concern, Science Education, Energy Education

777. Talarowski, F.S. (1983). Attitudes toward and perceptions of water conservation in a southern California community. (Doctoral dissertation, University of California, Santa Barbara, 1982). Dissertation Abstracts International, 44(1), 363-B. UMI No. DEP83-10220.

Descriptors: Issue Investigation and Evaluation Skills, Citizenship Action, Social Research, Status Study, Descriptive Research, Ex Post Facto Research, Perceptions/Beliefs, Attitudes, Personal Responsibility, Behaviors, Conservation Education

778. Temple, J.A. (1985). Three interactive processes of social infleunce: Facilitating change in energy conservation attitudes and actions as a function of exposure to five types of communication strategies. (Doctoral dissertation, University of California, Santa Cruz, 1985). Dissertation Abstracts International, 46(7), 2502-B. UMI No. DES85-20469.

Descriptors: Citizenship Action, Adult/Continuing Education, Social Research, Model Building, Theoretical Research, Perceptions/Beliefs, Attitudes, Values, Verbal Commitment/Intention, Behaviors, Energy Education, Communications

779. Ten Brink, B.L. (1984). Fifth grade students attitudes toward ecological and humane issues involving animals. (Doctoral dissertation, University of Texas at Austin, 1984). Dissertation Abstracts International, 45(7), 2057-A. UMI No. DER84-21810.

Descriptors: Parks/Natural Areas, Program Evaluation, Experimental Research, Gender, Environmental Sensitivity, Attitudes, Issue-Based, Science Education

780. Texley, J.T. (1981). The development of a group test of formal operational logic in the content area of environmental science. (Doctoral dissertation, Wayne State University, 1980). Dissertation Abstracts International, 41(10), 4351-A. UMI No. DEN81-07247.

Descriptors: Middle/Junior High, Secondary, Cognitive, Instrument Development, Theoretical Research, Formal, Age, Science Education

781. Thigpen, J.F. (1989). The sociology of soil conservation. (Doctoral dissertation, University of Kentucky, 1988). Dissertation Abstracts International, 49(12), 3890-A. UMI No. DEW89-05869.

Descriptors: Citizenship Action, Social Research, Model Building, Prediction Research, Secondary Analysis, Social Background, Economic Background, Concern, Behaviors, Conservation Education

782. Thomas, J.N. (1986). Goal setting in a resource management task. (Doctoral dissertation, University of South Florida, 1985). Dissertation Abstracts International, 47(2), 834-B. UMI No. DES86-08092.

Descriptors: Higher Education, Program Evaluation, Experimental Research, Simulations, Cognitive Strategies, Attitudes, Issue-Based, Resource Management Education

783. Thompson, J.R. (1981). A comparative study of Energy and Man's Environment upon fifth grade students. (Doctoral dissertation, University of Wyoming, 1980). Dissertation Abstracts International, 41(2), 4968-A. UMI No. DEN81-11614.

Descriptors: Elementary, Program Evaluation, Experimental Research, Formal, Residence, Gender, Knowledge, Attitudes, Energy Education

784. Townsend, R.D. (1982). An investigation into the underlying structure of the domain of environmental education concepts. (Doctoral dissertation, Ohio State University, 1982). Dissertation Abstracts International, 43(5), 1492-A. UMI No. DEO82-22192.

Descriptors: Ecology Education, Model Building, Curriculum Development, Program Development, Theoretical Research, Descriptive Research, Concepts, Issue-Based, Resource Management Education, Social Studies Education, Population Education, Values/Moral Education

785. Tsavaris, J.E. (1981). Whales, whaling and conservation: A generalized approach using cognitive, affective, and psychomotor objectives to understand the biological, technological, and economic aspects of declining cetacean populations. (Doctoral dissertation, Teachers College, Columbia University, 1981). Dissertation Abstracts Internaitonal, 42(5), 2057-A. UMI No. DEN81-22992.

Descriptors: Ecology Education, Issue Identification and Analysis Skills, Secondary, Teacher Education Inservice, Cognitive, Affective, Curriculum Development, Theoretical Research, Media-Based, Marine Education

786. Tudor, M. (1990). A study of the expert and novice differences in strategies to problem solve an environmental issue using a verbal response. (Doctoral dissertation, University of Wisconsin - Milwaukee, 1989). Dissertation Abstracts International, 51 (4), 1106-A. UMI No. DEX90-21154.

Descriptors: Issue Investigation and Evaluation Skills, Higher Education, Hypothesis Generation, Descriptive Research, Group Membership, Knowledge, Cognitive Strategies, Moral Development, Science Education, Social Studies Education, Energy Education

787. Tufuor, J.K. (1984). Changes in students' atittudes towards conservation resulting from outdoor education: A case study. (Doctoral dissertation, University of British Columbia, 1982). Dissertation Abstracts International, 45(5), 1296-A.

Descriptors: Environmental Sensitivity, Camps/Residential Centers, Program Evaluation, Naturalistic Research, Field Trip, Media-Based, Attitudes, Behaviors, Outdoor Education, Conservation Education

788. Turner, C.S. (1985). Perceived thermal comfort and energy conservation strategies in residential heating. (Doctoral dissertation, Virginia Polytechnic Institute and State University, 1985). Dissertation Abstracts International, 46(8), 2642-B. UMI No. DES85-21360.

Descriptors: Camps/Residential Centers, Social Research, Hypothesis Generation, Naturalistic Research, Perceptions/Beliefs, Behaviors, Energy Education

789. Tyler, L.L. (1983). Energy education of low-income urban tenants. (Doctoral dissertation, Virginia Polytechnic Institute and State University, 1981). Dissertation Abstracts International, 44(1), 129-B. UMI No. DEP83-20675.

Descriptors: Adult/Continuing Education, Social Research, Program Evaluation, Experimental Research, Non-Formal, Individualized Instruction, Economic Background, Urban, Knowledge, Attitudes, Behaviors, Energy Education

790. Ulmer, D.C. (1983). Implementing energy education focusing on attitudes and concerns. (Doctoral dissertation, University of Nebraska-Lincoln, 1983). Dissertation Abstracts International, 44(8), 2348-A. UMI No. DEQ83-28200.

Descriptors: Secondary, Teacher Education Inservice, State Agencies/Programs, Psychomotor, Program Implementation, Program Evaluation, Experimental Research, Trend Analysis, Attitudes, Concern, Science Education, Social Studies Education, Energy Education

791. Umelo, A.N. (1984). A survey of environmental perceptions and knowledge of environmental issues possessed by science and non-science educators in Nigeria. (Doctoral dissertation, The American University, 1982). Dissertation Abstracts International, 43(10), 3281-A. UMI No. DEP83-04178.

Descriptors: Issue Awareness/Knowledge of Issues, Higher Education, Teacher Education Inservice, Hypothesis Generation, Descriptive Research, Group Membership, Perceptions/Beliefs, Knowledge, Science Education, International

792. Urich, J.R. (1987). Homeowners energy conservation and consumption behavior: Wood-users and non/low-wood users. (Doctoral dissertation, University of Minnesota, 1986). Dissertation Abstracts International, 47(10), 4132-B. UMI No. DET87-03423.

Descriptors: Citizenship Action, Social Research, Model Building, Prediction Research, Secondary Analysis, Economic Background, Residence, Gender, Behaviors, Energy Education

793. Valenti, J.M. (1983). An environmental attitude survey: Costa Rica. (Doctoral dissertation, University of Michigan, 1983). Dissertation Abstracts International, 44(2), 443-B. UMI No. DEQ83-14372.

Descriptors: Social Research, Status Study, Descriptive Research, Economic Background, Sources of Information, Knowledge, Attitudes, Concern, Behaviors, Issue-Based, Resource Management Education, Communications, International

794. van Seters, P. (1990). Magnificent places: Public efforts to protect natural resources. (Doctoral dissertation, University of California, Berkeley, 1989). Dissertation Abstracts International, 50(10), 3367-A. UMI No. DEX90-06506.

Descriptors: Citizenship Action, State Agencies/Programs, Social Research, Naturalistic Research, Conservation Education, Resource Management Education, Social Studies Education

795. Vaughn, D.L. (1981). Effectiveness of television instruction in teaching solar energy principles to postsecondary vocational students. (Doctoral dissertation, New Mexico State University, 1980). Dissertation Abstracts International, 41(9), 4011-A. UMI No. DEN81-04834.

Descriptors: Higher Education, Adult/Continuing Education, Program Evaluation, Experimental Research, Formal, Media-Based, Knowledge, Attitudes, Issue-Based, Vocational Education, Energy Education

796. Veeravatnanond, V. (1984). The current status of Thai teacher institutions in regard to environmental problems and a proposed environmental curriculum system for teacher training programs. (Doctoral dissertation, North Texas State University, 1984). Dissertation Abstracts International, 45(3), 818-A. UMI No. DEQ84-14123.

Descriptors: Issue Awareness/Knowledge of Issues, Higher Education, Teacher Education Preservice, Teacher Education Inservice, Status Study, Curriculum Development, Descriptive Research, Discussion, International

797. Villasmil, R.J. (1985). A survey of the energy knowledge and attitudes of secondary fifth year students in official high schools having both science and humanities majors in Venezuela. (Doctoral dissertation, Ohio State University, 1985). Dissertation Abstracts International, 46(3), 667-A. UMI No. DER85-10649.

Descriptors: Secondary, Status Study, Descriptive Research, Residence, Gender, Sources of Information, Perceptions/Beliefs, Knowledge, Attitudes, Science Education, Social Studies Education, Issue-Based, Energy Education, International

798. Volk, T. (1983). A national survey of curriculum needs as perceived by professional environmental educators. (Doctoral dissertation, Southern Illinois University at Carbondale, 1983). Dissertation Abstracts International, 44(5), 1327-A. UMI No. DEP83-21474.

Descriptors: Ecology Education, Issue Awareness/Knowledge of Issues, Issue Investigation and Evaluation Skills, Citizenship Action, K-12, Higher Education, Teacher Education Inservice, Status Study, Needs Assessment, Curriculum Development, Descriptive Research

799. Wagener, D.J. (1987). Sociological factors influencing the decision of Iowa farmers to adopt needed soil conservation practices. (Doctoral dissertation, Iowa State University, 1987). Dissertation Abstracts International, 48(7), 1890-A. UMI No. DEV87-21940.

Descriptors: Citizenship Action, Social Research, Model Building, Theoretical Research, Prediction Research, Social Background, Economic Background, Behaviors, Conservation Education, Resource Management Education

800. Wakeley, L.D. (1985). Adult education about atomic energy, 1945-1948, A case study in science for society. (Doctoral dissertation, The Pennsylvania State University, 1984). Dissertation Abstracts International, 46(2), 331-A. UMI No. DER85-06697.

Descriptors: Adult/Continuing Education, Program Development, Program Implementation, Historical Research, Discussion, Media-Based, Sources of Information, Science Education, STS Education, Energy Education, Communications

801. Walker, S.E. (1988). Predictors of cognitive achievement in marine education among elementary, middle, and secondary school teachers in Mississippi and Alabama. (Doctoral dissertation, University of Southern Mississippi, 1988). Dissertation Abstracts International, 49(8), 2183-A. UMI No. DEW88-19350.

Descriptors: K-12, Teacher Education Inservice, Hypothesis Generation, Program Evaluation, Pre-Experimental Research, Prediction Research, Ethnic Background, Residence, Age, Gender, Knowledge, Marine Education

802. Wallace, D.R. (1987). Impact of the minority apprenticeship program experience on selection of a major preference in the College of Agriculture and Natural Resources by minority freshmen at Michigan State University. (Doctoral dissertation, Michigan State University, 1986). Dissertation Abstracts International, 47(11), 3949-A. UMI No. DET87-00534.

Descriptors: Secondary, Higher Education, Program Evaluation, Experimental Research, Action Learning, Educational Background, Ethnic Background, Residence, Gender, Resource Management Education, Vocational Education

803. Warner, R.E. (1981). Factors affecting the adoption of wildlife conservation practices by east-central Illinois farmers and their educational implications. (Doctoral dissertation, University of Illinois at Urbana-Champaign, 1981). Dissertation Abstracts International, 42(7), 2978-A. UMI No. DE081-27726.

Descriptors: Citizenship Action, Adult/Continuing Education, Social Research, Program Evaluation, Ex Post Facto Research, Economic Background, Age, Perceptions/Beliefs, Knowledge, Attitudes, Conservation Education, Resource Management Education

804. Webber, R.E. (1981). Psychological attributes of energy conservation activity. (Doctoral dissertation, University of Tennessee, 1980). Dissertation Abstracts International, 41(8), 3223-B. UMI No. DEN81-04633.

Descriptors: Citizenship Action, Social Research, Model Building, Prediction Research, Perceptions/Beliefs, Behaviors, Energy Education

805. Weicherding, P.J. (1984). Socio-psychological determinants of attitudes toward natural resources. (Doctoral dissertation, University of Minnesota, 1984). Dissertation Abstracts International, 45(8), 2736-B. UMI No. DER84-24761.

Descriptors: Social Research, Hypothesis Generation, Descriptive Research, Prediction Research, Educational Background, Urban, Age, Environmental Sensitivity, Perceptions/Beliefs, Attitudes, Issue-Based, Resource Management Education

806. Weinhold, J.B. (1987). A resource guide for planetary education. (Doctoral dissertation, The Union for Experimenting Colleges and Universities, 1987). Dissertation Abstracts International, 48(8), 2029-A. UMI No. DEV87-25100.

Descriptors: Environmental Sensitivity, Model Building, Curriculum Development, Theoretical Research, Pre-Experimental Research, Action Learning, Global Education, Relogious Education

807. Weirich, R.C. (1989). Science, Technology and Society (STS): It's meaning and assessment of eighth and eleventh grade Maine students' knowledge of STS and selected factors that affect STS knowledge. (Doctoral dissertation, University of Maine, 1988). Dissertation Abstract International, 49(11), 3322-A. UMI No. DEW89-01761.

Descriptors: Middle/Junior High, Secondary, Model Building, Instrument Development, Program Development, Secondary Analysis, Educational Background, Gender, Sources of Information, Knowledge, Perceptions/Beliefs, STS Education

808. Weitzer, W.H. (1981). Research on environmental images: The perception and use of urban parks. (Doctoral dissertation, University of Massachusetts, 1981). Dissertation Abstracts International, 41(12), 4750-B. UMI No. DEN81-10389.

Descriptors: Environmental Sensitivity, Parks/Natural Areas, Psychomotor, Social Research, Model Building, Descriptive Research, Economic Background, Residence, Gender, Perceptions/Beliefs, Knowledge, Attitudes

809. Welch, M. (1982). An examination of the relationships between environmental knowledge, attitudes, and behavior. (Doctoral dissertation, University of California at Los Angeles, 1982). Dissertation Abstracts International, 43(4), 1032-A. UMI No. DEO82-19780.

Descriptors: Issue Awareness/Knowledge of Issues, Middle/Junior High, Cognitive, Affective, Program Evaluation, Experimental Research, Knowledge, Attitudes, Behaviors, Science Education, Social Studies Education

810. Wentworth, W.R. (1988). Energy conservation attitudes, intentions, and behaviors of homeowners in Staten Island, New York. (Doctoral dissertation, City University of New York, 1988). Dissertation Abstracts International, 49(8), 3505-B. UMI No. DEW88-21128.

Descriptors: Citizenship Action, Social Research, Model Building, Prediction Research, Attitudes, Locus of Control/Efficacy, Verbal Commitment/Intention, Behaviors, Energy Education

811. Wilhelm, M.S. (1982). Direct and indirect conservation of fossil fuel energy: The influence of financial and philosophical motivators and available human resources. (Doctoral dissertation, Michigan State University, 1982). Dissertation Abstracts International, 43(2), 560-A. UMI No. DEO82-16600.

Descriptors: Citizenship Action, Social Research, Model Building, Prediction Research, Secondary Analysis, Educational Background, Economic Background, Perceptions/Beliefs, Locus of Control/Efficacy, Behaviors, Energy Education

812. Williams, S.E. (1985). Energy education for resource limited Oklahomans: A policy evaluation. (Doctoral dissertation, Oklahoma State University, 1984). Dissertation Abstracts International, 45(12), 3791-B. UMI No. DER85-04391.

Descriptors: Citizenship Education, State Agencies/Programs, Social Research, Program Evaluation, Pre-Experimental Research, Economic Background, Residence, Age, Behaviors, Energy Education

813. Wilson, D.L. (1981). High school students' attitudes toward science and the marine environment following a summer marine science program. (Doctoral dissertation, University of Alabama, 1981). Dissertation Abstracts International, 42(6), 2599-A. UMI No. DEN81-26860.

Descriptors: Outdoor Classroom, Secondary, Program Evaluation, Ex Post Facto Research, Field Trip, Gender, Attitudes, Vocational Education, Science Education, Marine Education

814. Wilson, R.J. (1986). Modal salient beliefs toward environmental action strategies of groups displaying different levels of action behavior. (Doctoral dissertation, Southern Illinois University at Carbondale, 1985). Dissertation Abstracts International, 46(11), 3312-A. UMI No. DES85-26751.

Descriptors: Citizenship Action, Social Research, Instrument Development, Hypothesis Generation, Descriptive Research, Ex Post Facto Research, Group Membership, Perceptions/Beliefs, Behaviors

815. Wilson, T.E. (1981). A content analysis of environmental problems in basal reading textbooks. (Doctoral dissertation, The Pennsylvania State University, 1980). Dissertation Abstracts International, 41(10), 4282-A. UMI No. DEN81-07652.

Descriptors: Issue Awareness/Knowledge of Issues, Elementary, Instrument Development, Document Analysis, Descriptive Research, Text-Based, Ethnic Background, Residence, Age, Gender, Language Arts Education

816. Wilson-Giordano, S. (1981). Study of environmental knowledge, locus of control, demographic variables and attributions in predicting consumer behavior. (Doctoral dissertation, Rutgers University, 1981). Dissertation Abstracts International, 41(9), 3975-A. UMI No. DEN81-05222.

Descriptors: Citizenship Action, Social Research, Model Building, Prediction Research, Educational Background, Economic Background, Age, Perceptions/Beliefs, Knowledge, Locus of Control/Efficacy, Behaviors

817. Winek, G.J. (1982). The establishment of goals and objectives for energy education programs. (Doctoral dissertation, University of Maryland, 1981). Dissertation Abstracts International, 43(3), 703-A. UMI No. DEO82-14495.

Descriptors: Secondary, Curriculum Development, Delphi Study, Issue-Based, Vocational Education, Energy Education

818. Winsor, D.W. (1982). Toward a national program of nonformal population education in Sri Lanka. (Doctoral dissertation, Florida State University, 1981). Dissertation Abstracts International, 42(8), 3401-A. UMI No. DEO82-25794.

Descriptors: National Agencies/Programs, Status Study, Model Building, Program Development, Document Analysis, Non-Formal, Issue-Based, Population Education, International

819. Wintz, M.M. (1988). Environmentalism: Implications for environmental education. (Doctoral dissertation, Temple University, 1987). Dissertation Abstracts International, 49(1), 69-A. UMI No. DEV88-03855.

Descriptors: Citizenship Action, Social Research, Program Development, Theoretical Research, Issue-Based

820. Woodcock, D.M. (1982). A functionalist approach to environmental preferences. (Doctoral dissertation, University of Michigan, 1982). Dissertation Abstracts International, 43(2), 515-B. UMI No. DEO82-15108.

Descriptors: Ecology Education, Parks/Natural Areas, Higher Education, Hypothesis Generation, Descriptive Research, Prediction Research, Gender, Environmental Sensitivity, Visual Perceptions/Preferences

821. Wyche, G.S. (1982). Changing atttudes of undergraduate students in regard to the urban environment. (Doctoral dissertation, American University, 1982). Dissertation Abstracts International, 43(2), 384-A. UMI No. DE082-15199.

Descriptors: Higher Education, Program Evaluation, Experimental Research, Urban, Attitudes, Issue-Based

822. Yates, S.M. (1983). Using prospect theory to create persuasive communications about solar water heaters and energy conservation. (Doctoral dissertation, University of California, Santa Cruz, 1982). Dissertation Abstracts International, 44(6), 2019-B. UMI No. DEP83-23465.

Descriptors: Citizenship Action, Social Research, Program Evaluation, Experimental Research, Knowledge, Attitudes, Preferences, Verbal Commitment/Intention, Energy Education, Communications

823. Yearns, M.E. (1984). The Home Energy Audit Program: Its effects on conservation behavior. (Doctoral dissertation, Iowa State University, 1984). Dissertation Abstracts International, 45(7), 2263-A. UMI No. DER84-23689.

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Descriptors: Issue Awareness/Knowledge of Issues, Higher Education, Cognitive, Affective, Program Evaluation, Experimental Research, Attitudes, Science Education

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Descriptors: Issue Identification and Analysis Skills, Issue Investigation and Evaluation Skills, Adult/Continuing Education, Social Research, Program Evaluation, Experimental Research, Perceptions/ Beliefs, Knowledge, Preferences, Issue-Based

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Descriptors: Teacher Education Inservice, Program Evaluation, Experimental Research, Concepts, Knowledge, Concern, Science Education, Energy Education

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Descriptors: Citizenship Action, Adult/Continuing Education, Model Building, Program Implementation, Naturalistic Research, Energy Education

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81 to 90	No Descriptors
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81 to 90	563, 705, 717, 744, 745, 787, 788
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71 to 80	No Descriptors
81 to 90	No Descriptors
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81 to 90	523, 546, 559, 576, 577, 579, 581, 585, 587, 600, 607, 611, 621, 628, 629, 631, 635, 638, 641, 643, 653, 659, 669, 681, 682, 685, 690, 702, 708, 709, 710, 711, 712, 714, 724, 726, 728, 737, 746, 749, 752, 753, 755, 766, 772, 773, 776, 777, 778, 781, 792, 794, 798, 799, 803, 804, 810, 811, 814, 816, 819, 822, 829
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81 to 90	545, 576, 592, 593, 594, 598, 609, 615, 655, 656, 670, 707, 744, 754, 780, 782, 785, 786, 809, 826
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81 to 90	545, 576, 592, 598, 670, 707, 782, 786
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81 to 90	532, 550, 553, 555, 566, 575, 633, 642, 645, 654, 660, 669, 681, 723, 728, 734, 735, 740, 743, 753, 778, 793, 800, 822, 823, 825
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Periodical Lit No Descriptors

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71 to 80 No Descriptors

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81 to 90	524, 534, 541, 545, 548, 554, 557, 558, 574, 602, 603, 616, 620, 625, 630, 661, 665, 668, 671, 675, 684, 688, 706, 716, 729, 758, 762, 763, 765, 784, 828
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81 to 90	526, 527, 529, 533, 548, 553, 559, 570, 596, 613, 617, 619, 649, 664, 670, 678, 680, 695, 700, 702, 722, 734, 740, 741, 756, 761, 768, 769, 779, 782, 784, 793, 795, 797, 805,

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81 to 90	No Descriptors

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71 to 80	No Descriptors
81 to 90	No Descriptors

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71 to 80	228, 233, 237, 285, 320, 341, 343, 374, 411, 420, 431, 433, 489, 496, 505, 511
81 to 90	529, 540, 569, 571, 608, 610, 612, 616, 667, 722, 756, 758, 798, 801

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81 to 90	524, 529, 530, 533, 534, 535, 538, 541, 544, 545, 547, 548, 554, 557, 565, 567, 572, 574, 578, 580, 581, 583, 590, 591, 592, 595, 596, 602, 603, 604, 607, 616, 617, 620, 621, 622, 625, 627, 629, 632, 640, 642, 644, 648, 654, 655, 658, 662, 666, 667, 668, 670, 671, 674, 675, 676, 682, 684, 686, 687, 688, 694, 697, 704, 705, 706, 707, 710, 712, 716, 719, 720, 725, 732, 733, 734, 737, 739, 745, 750, 752, 753, 754, 755, 757, 758, 760, 762, 763, 765, 771, 774, 776, 783, 786, 789, 791, 793, 795, 797, 801, 803, 807, 808, 811, 816, 822, 825, 827, 828

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81 to 90	547, 630, 719, 769
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Periodical Lit	No Descriptors
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81 to 90	651, 815
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81 to 90	558, 578, 641, 662, 671, 673, 703, 762
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Periodical Lit	004, 019, 161, 169, 183
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71 to 80	No Descriptors
81 to 90	No Descriptors

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71 to 80 229, 262, 287, 333, 335, 376, 417, 475, 493, 501
81 to 90 559, 587, 611, 617, 629, 695, 714, 737, 755, 810, 811, 816

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81 to 90 544, 554, 586, 594, 625, 642, 652, 657, 667, 673, 675, 730, 758, 760, 801, 813

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Periodical Lit No Descriptors
Dissertation
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81 to 90 525, 535

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Periodical Lit No Descriptors
Dissertation
71 to 80 No Descriptors
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81 to 90	554, 578, 652, 654, 660, 662, 697, 734, 743, 750, 765, 769, 785, 787, 795, 800
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Periodical Lit	002, 010, 011, 014, 020, 022, 025, 030, 034, 047, 060, 074, 093, 098, 110, 129, 132, 134, 143, 146, 147, 153, 154, 166, 169, 175, 188, 201
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81 to 90	528, 530, 538, 541, 543, 547, 554, 576, 591, 614, 619, 626, 632, 656, 662, 666, 668, 676, 689, 693, 704, 705, 713, 717, 732, 737, 738, 742, 763, 765, 771, 780, 807, 809, 824
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81 to 90	525, 530, 556, 597, 607, 608, 613, 621, 629, 637, 636, 646, 653, 665, 670, 672, 677, 678, 681, 682, 687, 692, 694, 699, 700, 701, 702, 708, 714, 726, 728, 741, 746, 747, 749, 752, 755, 756, 775, 776, 778, 781, 784, 792, 799, 804, 806, 807, 808, 810, 811, 816, 818, 823
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81 to 90	541, 599, 648, 747, 763
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81 to 90	542, 548, 602, 616, 625, 711, 719, 724, 735, 753, 770, 818
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81 to 90	523, 526, 527, 531, 532, 533, 549, 550, 555, 560, 568, 570, 573, 579, 597, 607, 613, 618, 621, 624, 627, 628, 631, 634, 635, 636, 640, 641, 642, 643, 646, 653, 659, 664, 669, 681, 682, 683, 687, 691, 692, 694, 696, 700, 702, 708, 709, 710, 714, 720, 723, 726, 728, 730, 733, 746, 749, 752, 755, 766, 768, 772, 773, 775, 777, 781, 788, 789, 792, 793, 799, 804, 805, 808, 810, 811, 814, 816, 819, 822, 825

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